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FINANCIAL AND OPERATING RESULTS OF THE BRITISH GROUP RAILWAYS IN 1938

Our annual analysis of the accounts and statistics of the British group Railways, as shown in the published reports for the past year, is presented as a Supplement to every copy of this week's issue. Extra copies of the Supplement can be supplied, price 1s. each.

Public Corporation Stockholders

IT may have occurred to many of our readers that Mr. Frank Pick's explanation of the interest position of London Transport "C" stock, given in his address to the Institute of Transport on March 13, was the type of statement of as much practical value to stockholders as of academic value to transport students. A curious result of the constitution of the board is that, in the absence of a general meeting, stockholders should learn, if they do learn, of a matter primarily affecting themselves, through newspaper reports of a lecture delivered to a learned body to which they may neither crave nor be qualified to belong. The position will doubtless be pondered by shareholders in British Airways, and Imperial Airways, which companies the Government, acting upon the recommendations of the Cadman Committee as reported in our issue of November 18, 1938, is proposing to amalgamate as a public corporation. Figures can be made to argue that London Transport stockholders are an apathetic body who would not take active part in a meeting

even if there were one. Commenting on this matter some time ago, *The Financial Times* said that London Transport has some 70,600 stockholders, and before they all received the annual report free of charge, only an average of 2,000 copies were sold, of which a large proportion seems to have been bought by others than stockholders. Perhaps, however, this apathy is an effect of the present situation rather than an excuse for it.

* * * *

Southport & Cheshire Lines Extension Railway

This company's double-track railway of 14 miles from the Cheshire Lines station at Aintree to Lord Street station, Southport, was opened for passenger traffic on September 1, 1884, and for goods traffic with Southport station on June 1, 1885. A new seaside resort at Ainsdale Beach was opened on the system a few years ago. Though a separate undertaking, the railway has always been worked by the Cheshire Lines Committee. It connects with the former Lancashire & Yorkshire Railway at a point just north of Aintree, and again at Hillhouse. In the report for the year 1938, Account No. 9 shows "proportion of receipts under working agreement, after adjustment" at £8,131, compared with £8,079 for 1937, and the balance carried to net revenue account is £7,412, against £7,451. This balance, together with £1,925 brought in and bank interest, &c., £220, covers the debenture interest of £6,000 and enables 2 per cent. for the year to be paid on the £75,000 of 2½ per cent. preference stock, leaving £2,057 to be carried forward. A 2 per cent. preference dividend has been regularly paid from 1921 to 1938, inclusive, but the £288,000 of ordinary stock has never received a return.

* * * *

The Week's Traffics

The combined decrease of £88,000 shown by the four main-line companies for the past week in comparison with the 11th week of 1938 goes against a net decrease of £56,000 in the last-mentioned week in comparison with the corresponding week in 1937. For the 10th week of 1939 the combined decrease was £86,000. Total earnings for the eleven weeks of 1939 amount to £30,354,000, a decrease of £1,760,000 or 5.48 per cent. in comparison with 1938.

	11th Week				Year to date	
	Pass.	&c. Goods	&c. Coal	Total	Inc. or Dec.	%
L.M.S.R. ..	7,000	30,000	6,000	31,000	718,000	- 5.51
L.N.E.R. ..	3,000	28,000	5,000	30,000	677,000	- 6.96
G.W.R. ..	3,000	4,000	3,000	10,000	289,000	- 5.35
S.R. ..	10,000	5,500	1,500	17,000	76,000	- 1.92

By its gain of £2,514 for the past week the Great Southern Railways Company has reduced its decrease on the eleven weeks to £9,265. With an increase of £1,800 for the past week the Great Northern (Ireland) is now £12,700 to the good on the year to date, passengers being up £2,300 and goods up £10,400.

* * * *

The Mechanical Engineers' Journal

The March issue of the *Journal of the Institution of Mechanical Engineers* is the first to appear in a new format, and including a wider range of information on the activities of the institution than has hitherto been practicable. A foreword by the President, Mr. E. Bruce Ball, explains that provision has now been made for the publication of the valuable material afforded by the informal meetings and discussions at branches, in addition to short papers reviewing advances in selected subjects. It will also be possible to make prompter publication of matter

relating to progress in the science and practice of mechanical engineering. The size of the new journal is 11 in. x 8½ in., and it adopts a type and layout that combine legibility with a dignity of appearance in harmony with the serious purpose of the contents. Great credit is due to those responsible for arranging the new format in such a way that progress and tradition are happily combined. We notice in particular that the journal is from cover to cover the organ of its institution, no advertising being included. The result must be to create an additionally favourable impression of the standing and resources of the institution among all into whose hands the journal falls.

* * * *

Overseas Railway Traffics

Brazilian railways are at present having the benefit of a slight improvement in exchange, and during the past fortnight receipts of the Great Western of Brazil have advanced by £5,900, giving an improvement of £26,700 for the year to date. On the Leopoldina the increase during the two weeks has been £2,696, and the advance so far on the year has been £14,065. The Uruguayan exchange has not been so favourable and has slowed down the increase in sterling receipts.

	No. of Weekly Week Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
Buenos Ayres & Pacific ..	38th 115,074	+ 6,513	3,192,746	- 98,511
Buenos Ayres Great Southern ..	38th 172,270	- 14,455	5,382,505	- 308,188
Buenos Ayres Western ..	38th 53,164	+ 8,251	1,664,640	- 61,663
Central Argentine ..	38th 127,854	+ 17,758	4,379,696	- 315,374
Canadian Pacific ..	10th 461,800	- 4,400	4,717,400	- 163,200
Bombay, Baroda & Central India	50th 240,300	- 48,600	8,286,150	- 115,050

Central Argentine traffics during the past fortnight have advanced by £41,908, and those of the Buenos Ayres Western by £15,075.

* * * *

New Cableway Projected in Switzerland

Quite a paper war has recently been waged between those who support the decision of the Zermatt Commune to build a cableway from Riffelberg, near Zermatt, to the Gandegg, close to the Italo-Swiss frontier, and those who oppose its construction on æsthetic or other grounds. The amount of correspondence in *The Times* on the subject has brought forth a joint letter from the President and the Secretary of the Commune giving the objects and nature of the projected line; the Commune considers that the line will not spoil the beauty of the High Alps. One correspondent adduces the military reasons against the building of the railway, contending that in wartime it would assist a surprise Italian attack—the Italians already have two cable lines up their side of the Theodul Pass, which crosses the frontier. Another correspondent answers the "æsthetes" by stating that most visitors to the Alps are more interested in getting good skiing than in enjoying scenery—the most prosperous Alpine centres today are those which provide good downhill ski-runs rather than magnificent scenery. Presumably, unless the Federal authorities see in the projected line a threat to Switzerland's security, the last word rests with the Council of the Zermatt Commune, which consists of seven able and respected villagers who are hardly likely to act against the wishes of the inhabitants and the interests of the district.

* * * *

Shunting

Many of us are apt to overlook the prominent rôle played by shunting in the operation of freight traffic, until we are brought face to face with it. It was, therefore, by a happy inspiration that the L.M.S.R. authorities enabled practice and theory to be combined, by affording facilities

to members of the Railway Students' Association to see phases of this work performed at Willesden, prior to the reading by Mr. T. W. Royle of a paper on modernisation of marshalling yards and shunting methods. In the successful and efficient handling of train-loads of unclassified traffic, speed, economy and, by no means least, safety are essential factors, and visitors to Willesden were duly impressed by the demonstration of various improvements which had contributed to the enhancement of all three. Mr. Royle not only stressed the importance of these factors in his paper, but showed how his department had striven and was still striving, with the help of analyses of every feature of work carried out at marshalling yards, and despite innumerable handicaps, to secure an optimum output at a minimum cost. Shunting has been described as a "necessary evil," and the research methods employed by the L.M.S.R., which are to be carried a step further by the experimental mechanisation of Toton down yard, have undoubtedly achieved much towards lightening the burden it places upon freight-train working.

* * * *

Speed and Permanent Way

Mr. A. H. McMurdo, Divisional Engineer, Glasgow, L.M.S.R., gave a useful review of modern permanent way practice recently to the Institute of Engineers and Shipbuilders in Scotland under the title "Railways and the Quest for Speed." It is published in the current *Transactions* of that body, together with the subsequent discussion, in which handsome tribute was paid to the service rendered to railways by the Hallade track register introduced to this country from France, the land of its origin, by Mr. C. J. Brown, when he was Chief Engineer of the Great Northern Railway. The author, besides describing the instrument and its uses, which have made so marked a contribution to modern permanent way practice, referred also to the service performed by the Bridge Stress Committee, as well as to the numerous recent refinements which have enabled engineers to maintain the track to a higher standard than before at a relatively lower cost. The building up under traffic of worn crossings by welding, ten years ago regarded as impracticable, is now among the established practices, and Mr. McMurdo mentioned that last year the L.M.S.R. in Scotland alone treated 1,058 crossings in this way, 755 by electric arc welding and 303 by the oxy-acetylene process.

* * * *

Some Pennsylvania Railroad Facts

Some remarkable statistics concerning the Pennsylvania Railroad of America appear in a recent publication of that company entitled *Train Talks*. In order of size, eight of the largest cities in the U.S.A. are actually located on the Pennsylvania system, namely, New York, Chicago, Philadelphia, Detroit, Cleveland, St. Louis, Baltimore, and Pittsburgh, which are first, second, third, fourth, sixth, seventh, eighth, and tenth in order respectively; Boston, the ninth, is tied to the Pennsylvania by a number of through services daily. Out of 45,400,000 people resident in the largest metropolitan districts in the country, 82 per cent. either live in cities on the Pennsylvania system, or are reached by through coaches to and from that railway. At the Pennsylvania station in New York, trains may be seen travelling to places as far apart as Montreal and Boston in the north, Chicago, St. Louis, Cincinnati, and Indianapolis in the west, and Miami and New Orleans in the south. Between 8 and 9 a.m. a train leaves this station every 51 sec., and over the three hours from 7 to 10 a.m. there is a train on the average once every minute. At 8.20 every morning 33 important expresses

are all in motion simultaneously on the main line between New York and Philadelphia, which has good grounds for claiming to be the busiest in the world. Among them, *en route* to New York, are the famous Broadway Limited and the General from Chicago; the Spirit of St. Louis, and the Cincinnati Limited, from those two cities; the Red Arrow, from Detroit; the Crescent and the Florida—New York Limited, from the Southern States; and the Pilgrim, from Washington to Boston. Moreover, in both directions, there are frequent expresses between New York and Philadelphia. All are electrically hauled and running at speeds between stops generally from 70 to 80 m.p.h.

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Enterprise in a South Gloucestershire Village

An article in *Quota News*, the journal of the L.M.S.R. Commercial Department, gives some interesting particulars about Yate, on the L.M.S.R. line from Derby to Bristol, a village which in the last decade or two has shown remarkable activity. Formerly an agricultural centre and the station for the Badminton country and the Duke of Beaufort's seat, it lost much of its position when the Great Western opened, in 1903, its Badminton station on the cut-off line to South Wales. The first move in restoring the balance was the establishment at Yate, during the war, of factories and an aerodrome. The village—noteworthy as being the only place in England where spar, a mineral used in sugar refining is found—is now a manufactory of electrical machinery. A progressive stationmaster and staff have seen to it that in a district so active at the present and with such good prospects for the future the goods and passenger facilities of the L.M.S.R. are kept ever before the trader and the public.

* * * *

Spring Points in India

Spring-returned points for railways were at one time regarded with disfavour, but in recent years have been applied to a number of locations, enabling economies to be made. Trailable facing-point locks have been adapted to them, but are at present, we believe, found in this country only on the Swansea & Mumbles line. In America, however, they are being used for passing loop points where trains run through at speed, the protecting automatic signals being controlled through suitable detectors on both point tongues and lock, with satisfactory results; much time previously consumed by train crews in setting points is thus saved. In the quarterly *Technical Bulletin* of the Indian Railway Board for October, 1938, Mr. A. C. Rose, Deputy General Manager, Madras & Southern Mahratta Railway, gives interesting details of the use of spring-returned points, with mechanical signals detecting them for facing movements; use is made of a special detector, having a sway-beam and pawl mechanism, so constructed that should the signal happen to be "off" when the points are trailed it is thrown to danger, no damage occurring to any of the equipment.

* * * *

Invalid Facilities on the G.W.R.

Publicity has lately been given in the press to the hiring of a special train on the G.W.R. to convey an invalid from Plymouth Docks to Paddington. We understand that the company arranges annually for some 1,300 invalid journeys, for which purpose a stock of saloons is maintained, equipped with couches suspended from the roof to avoid oscillation, accommodation for nurses, and cooking facilities. The majority of such journeys, however, is made in the compartments of ordinary coaches. At key stations

on the system the company has supplies of the Parratt stretcher, designed by an employee of the company to provide a stretcher that can be manœuvred easily through ordinary carriage doors and accommodated along one seat in the compartment, leaving the opposite seat free for those travelling with the sick person. An illustration and a description of this device were published in our issue of June 20, 1934. In the four years since this stretcher was introduced, patients have been conveyed with its aid between such distant points as Guernsey and Liverpool; Falmouth and London; and South Wales and Norfolk. For less serious cases, the company has invalid chairs available at the principal stations.

* * * *

The First Locomotives in Holland

The locomotives used in the first years of railways in the Netherlands ran between Amsterdam and Haarlem on the Holland Company's line, the first in the country (opened on September 24, 1839); and on the Netherlands Rhine Railway, opened in 1843 and affording communication between Utrecht and the Prussian frontier. An article by Mr. J. D. M. Bardet in *Spoor- en Tramwegen* for December 20, 1938, gives some interesting details. The first four engines for the Holland Company were supplied by Longridge from England and named *Snelheid* (*Speed*), *Arend* (*Eagle*), *Hoop* (*Hope*), and *Leeuw* (*Lion*). The nameplates of the first mentioned were incorrectly written *Snelhied*, but it is gratifying to read that the works put this right free of charge. In 1840 and 1841 two engines were obtained from Verveer's works at Amsterdam; these, the first ever built in the Netherlands, were on the style of some already ordered from Sharp and Roberts in England but not actually in service until the Rhine Railway was opened. Robert Stephenson also supplied several locomotives, as well as other Dutch workshops and a Belgian concern. Both railways were built to a gauge of 6 ft. 4½ in., but the Rhine Railway adopted the standard gauge in 1855 and the Holland Company's line was converted in 1866. Altogether 49 broad gauge locomotives were provided, nine of the Rhine line being transferred to the other company in 1855. Only five were converted to standard gauge after 1866.

* * * *

Seventy Years of "The Fish"

A series of coincidences in its early days led to a train of the New South Wales Government Railways receiving a curious nickname which has persisted right through to its seventieth birthday. "The Fish," as the train is called, has been evolved from the 5 o'clock ex-Sydney Southern and Western Mail, inaugurated in 1868. Its subsequent history was the subject of a paper read recently to the Australasian Railway Historical Society, and reported in *Transport and Engineering in Australia*. About the period of its inauguration, the train was regularly worked between Paramatta Junction (now Granville) and Penrith by a Beyer-Peacock 2-2-2 engine, in charge of a certain "Jock" Heron, who hailed from the Glasgow & South Western Railway. To his colleagues at Penrith he was known as the "Big Fish." When a few years later he was joined by a guard named Pike, and then, it is alleged, by a fireman called Salmon, the combination was such that the bestowal of the name "The Fish" on the train became inevitable as soon as its more dignified official title ceased to be representative. This occurred in June, 1880, when the Sydney—Mount Victoria portion was run as a separate train, and received the nickname inspired by the heroes who had previously worked forward the westbound section of the Southern and Western Mail from Paramatta.

London Passenger Fares

ON March 20 the Railway Rates Tribunal began hearing the application of the four main-line railway companies and the London Passenger Transport Board for increased charging powers in respect of journeys made exclusively within the London Transport area. The main-line companies are seeking power to increase their standard fares by 5 per cent., subject to certain fractions rules, similar to the increase ordered by the tribunal to operate as from October 1, 1937, in respect of passenger fares outside the London area. The board, however, is applying only in respect of certain railways owned jointly by it and the main-line companies and certain sections of the main lines within the London area over which the board's trains operate. If the applications are granted, it is estimated that the gross receipts of the London Passenger Transport pool, which includes revenue earned from the suburban railway services of the main-line railways, and revenue earned by the board within the area from its road and rail services, would be increased by £1,179,000 per annum. Of this sum it is estimated that the main-line companies would earn £515,000 and the board £664,000.

A large proportion of the main-line companies' additional revenue, however, would be earned from fares which are below the standard fares and which can be increased without reference to the tribunal, and it is considered that £300,000 could be obtained in this way, leaving only £215,000 within the jurisdiction of the tribunal. Of the board's estimated additional revenue of £664,000, it is considered that the tribunal will be required to sanction only £5,000, the balance being obtainable by the board by the exercise of powers which it already possesses. Should the tribunal grant the application, and the estimated additional revenue be secured, the operation of the pooling arrangement would result in the sum of £1,179,000 being divided as follows: L.P.T.B. £732,000; Southern Railway £300,000; L.N.E.R. £71,000; L.M.S.R. £60,000; and G.W.R. £16,000. Over 100 objections to the companies' applications have been lodged, however, by chambers of commerce, associations of rate-payers and tenants, sports clubs, and over fifty local authorities, and it is expected that the hearing may last more than a fortnight.

* * *

The Financial and Operating Results of the British Group Railways in 1938

THE general public would probably consider the launching of the "square deal" campaign as the outstanding railway event of 1938; those responsible for railway management will no doubt regard the year as one of the most anxious and difficult of recent times. A rise of £1,000,000 in gross receipts during the first ten weeks of the year gave no suggestion of the decline which was to follow. However, even by then the prospect of increased taxation loomed large, and, with the Budget, our worst fears were fulfilled. It may be worth recalling our comment in THE RAILWAY GAZETTE of April 29 last on that disastrous decision; we pointed out the inevitable effect of the extra taxation imposed in causing a reduction of individual spending power. According to the Board of Trade Index figure industrial production fell by 14 points during the period under review and unemployment increased by 20 per cent. Notwithstanding an ever-growing rate of rearmament, the output of coal fell by 12,000,000 tons compared with 1937 and the export of this commodity was 6,000,000 tons down; the production of pig iron and steel ingots was less by 20 per cent. The financial and operating results of the British group railways which we

publish as a supplement to this issue reflect the reaction of these events upon railway transport. The gross receipts of the four amalgamated railways from all sources were about £8,000,000 below the 1937 level although over £800,000 in excess of the 1936 figure, but net revenue was some £9,000,000 less than it was in 1937 and £7,000,000 or nearly 21 per cent. under the 1936 total, due to greater revenue expenditure, brought about by the higher cost of materials and wages which power to increase railway charges by 5 per cent. have failed to offset.

So far as receipts in respect of railway working are concerned it will be noticed that passenger train receipts have been substantially maintained, there being slight increases on the L.M.S.R. and Southern Railway and small decreases on the L.N.E.R. and G.W.R. It is in respect of goods train traffic that serious decline has taken place; some 21,000,000 tons or 14½ per cent. less merchandise has been carried and nearly 18,000,000 or 8·16 per cent. less coal was conveyed, while livestock also shows a decrease of nearly 8½ per cent. The disturbing element of these figures lies in the fact that they represent a decline in excess of what might reasonably be expected having regard to the degree of trade recession; for example, the reduction in coal production represents only two-thirds of the fall of 18,000,000 tons in the amount carried by the railways, from which it may be assumed that some 6,000,000 tons more was handled by other means compared with 1937. On the expenditure side the ratio of revenue expenditure on railway working to receipts has risen substantially in all cases, although the actual increase is £1,652,000 or 1½ per cent. which in view of the higher cost of wages and materials cannot be regarded as unsatisfactory. Maintenance and renewal of way and works is slightly less on the L.M.S.R. than the previous year and there are small increases on the G.W.R. and Southern, but on the L.N.E.R. Abstract "A" amounts to £6,140,000, a rise of some £769,000 or about 14 per cent.; of this latter sum increased renewal and maintenance of track accounts for about £606,000 but 347 miles of track have been renewed completely as against 293 miles the previous year. The G.W.R. and Southern have renewed less track than in 1937, and the L.M.S.R. rather more. It will be recalled that for some years expenditure under Abstract "A" has been comparatively low on the L.N.E.R., and it is possible that the increased traffic of 1937 called for a more extensive programme of track maintenance during 1938, also a considerable mileage of this company's lines now carry regular high-speed trains for which a very high standard of track maintenance is necessary and it may well be that this factor has some bearing on expenditure.

Maintenance of rolling stock, Abstract "B," calls for no special comment; all lines except the L.M.S.R. have spent rather more than the previous year; it will be noted that expressed as a percentage of traffic receipts the L.N.E.R. figure now stands at 18·49 per cent. as against 13·85, 13·64 and 11·83 per cent. on the L.M.S.R., G.W.R. and Southern respectively. Although fewer train-miles have been run on all lines except the Southern, the reduction has been insufficient to compensate for the increased cost of fuel and wages so that locomotive running expenses, Abstract "C," are somewhat higher in all cases. There are no abnormal features in Abstract "D," traffic expenses, which though slightly higher show little change from the previous year's working. General charges, Abstract "E" are appreciably lower on all lines except the L.N.E.R., which shows practically no change. The cost of collection and delivery of goods and parcels has fallen, but on the L.M.S.R. and G.W.R. to a smaller extent than the decrease in receipts for these services. Receipts on the Southern are some 2½ per cent. in excess of expenditure

but on all other lines expenditure exceeds revenue by about 25 per cent. Profits from steamboats are higher on the G.W.R. and Southern, on the L.M.S.R. they are 32 per cent. lower at £207,000, while on the L.N.E.R. there is a loss of £18,000 on the year's working compared with £49,000 profit in 1937. Revenue from road transport shows little change from the previous year but receipts from dock, harbours and wharves reflect the recession in overseas trade, and in spite of reduced expenditure on all lines net revenue is substantially lower in every case, there being an actual loss of £25,000 on the L.M.S.R., and on the Southern, G.W.R., and L.N.E.R. net profits are 11, 41, and 67 per cent. lower respectively.

Perhaps the most satisfactory feature of an otherwise melancholy set of figures is the fact that there is no evidence of the curtailment of expenditure necessary to maintain the undertakings in a thoroughly efficient state of repair. The whole burden of an unsatisfactory year has fallen upon the shareholders once again, but by resisting any temptation to defer maintenance until better times, managements have done everything possible to ensure they may reap proper reward for any improvement in business without reduction on account of deferred maintenance expenditure. Those responsible have managed the railways throughout a difficult year with great skill, but whether the railways are to continue pre-eminent in the transport world now rests with the Government and the public. We can only hope they will face this complex national problem with the same courage as the railways themselves without regard to vested interests or party politics but considering only the good of this great nation of producers and traders—who must also not be neglected in their vital rôle of consumers—which for a century the railways have served faithfully and well.

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Locomotive Balancing

IT is curious that principles which are accepted as commonplace today are so often preceded by a long period of doubt or neglect. In locomotive engineering there are many instances, among the most notable of which is that of internal streamlining or the provision of passages for the flow of steam having as unobstructed a course as possible, thus delivering steam to the cylinders with the minimum pressure drop from the boiler, and out to the atmosphere as freely as possible. Another common sense principle not yet fully appreciated relates to the balancing of locomotives. An article from a correspondent in India published in this issue describes some tests carried out with locomotives of the same type, one of which had 66 per cent. of its reciprocating weights balanced, and the other with the revolving parts completely balanced at the expense of the reciprocating parts, which were left completely unbalanced. Curiously enough, the tests appear to have been made to provide what *Punch* calls "a glimpse of the obvious," and proved that which scarcely needed proof, namely that the locomotive whose revolving parts were completely balanced gave no hammer blow at speed. It would have been useful had the opportunity been taken to ascertain whether any additional lateral stresses were delivered to the rails by these engines, and if so, to measure their extent; although, indeed, practical experience has already shown that with the great mass and rigid construction of the modern locomotive the effect of unbalanced reciprocating parts is unimportant. As our correspondent says, the realisation that it is possible completely to balance revolving parts of a locomotive without having regard to reciprocating masses opens the way to important developments both in locomotive design and traffic operation.

Railways in the U.S.S.R.

"TRANSPORT," said M. Voroshilov at the 18th Congress of the All-Union Communist Party, "is the blood brother of the Red Army. To safeguard the activity of the modern army a modern transport, excellently organised, working without flaws and without reproach, is necessary." Nevertheless, a good deal of the recent construction and improvement in operation of the railway system in the U.S.S.R. has been concerned not with military but with economic requirements, although it is true that the doubling of the Far Eastern section of the Trans-Siberian Railway, the construction of the alternative Baikal-Khabarovsk-Komsomolsk route, and the building of various strategic cut-offs have been largely military measures. Despite the strenuous endeavours put forward, particularly since L. M. Kaganovitch was appointed Commissar of Transport in 1935, the Soviet Railways still fall a good deal short of M. Voroshilov's dictum. If the ambitious ideas of the five-year and yearly programmes have not been met, the actual work accomplished is on a scale rarely contemplated, especially in connection with the people of an agricultural or thoroughly undeveloped country.

During the last five years only 2,000 miles of new route have been opened to traffic, contrasted with the total of 6,800 miles included in the approved plan, and with about 15,000 miles according to the second Five-Year Plan. In the same period 3,100 miles have been doubled against 6,000 miles proposed, and only 650 miles have been opened to electric traction compared with the figure of over 3,000 miles which appeared in the second Five-Year Plan. These proposals were far in advance of the existing Soviet potentialities, particularly as regards skilled organisation and labour, and in the earlier stages at least, also as regards quality of material. The grandiose, although really necessary, proposals for entirely new routes between Moscow and the Donbass, and from the Kussbass to the Urals, had to give way to a piecemeal form of construction, by modernising existing sections and constructing short new lengths, but for some years these two vital routes, both over 600 miles long, were in great danger of a complete breakdown, as, indeed, were other trunk routes. It must not be forgotten that coincident with the shocking quality of most of the early rails rolled in the U.S.S.R., the freight traffic over many important lines had increased 500 to 550 per cent., although the freight stock available had increased only from 160 to 180 per cent. Freight traffic in 1937 rose to 517 million tonnes and 335,000 million tonne-km., against the 475 million and 300,000 million envisaged by the second Five-Year Plan, although still some 8 per cent. below the year's estimates made in 1936. Even so, the actual figures represent an increase of 90 per cent. over the freight tonnage carried in 1932. The average haul has increased from 490 km. in 1913 to 585 km. in 1929 and to 686 km. in 1938, and reflects the vast distances between the various industrial centres. But whereas such hauls would be good for the railways in a "capitalist" country, they simply complicate operating and industrial problems in a land where everything is owned by the State.

The rolling stock programme has shown somewhat better results. About 4,200 locomotives have been built in the last five years, or slightly over 70 per cent. of the planned total of 5,900; 76 per cent. of the planned construction of freight stock has been completed, but only 18 per cent. of this stock has been equipped with automatic centre couplers against the 50 per cent. intended. Standardisation on the 2-10-2 types of freight locomotive has assisted the motive power portion of the programme. Taken broadly, the ratio of new freight engines to new passenger engines is

about 5 to 1, and the usual yearly plan covers the construction of approximately 1,000 freight engines. Nothing smaller than double-bogie wagons is now included in the freight stock programmes; special wagons include some six-axle wagons with a capacity of 100 tonnes, and some six-axle self-discharging hoppers of 1,750 cu. ft. capacity for the Balkash copper traffic. During the past 12 months the average daily locomotive mileage has risen from 260 to 270 km., and the freight wagon average from 150 to 156 km.

The average freight train has an end-to-end speed of 21.4 km.p.h. and a loading of 118 trailing axles carrying a mean load of 6 tonnes each. In the Donbass area mineral trains up to 5,000 tonnes in weight have been

operated, but the general maximum level in that district is 3,000 tonnes. On the Moscow—Donbass direct line the section from Birulevo to Kashira has been provided with a third track; the remainder is all double track and has automatic block signalling, which has now been applied to about 3,350 miles of route in the Union. Other recent work includes the realignment and modernisation of the Moscow—Negoreloje (Polish frontier) line to suit it for higher speeds (a minimum of 100 km.p.h. throughout); the construction of a 400-mile line from Asino to Tomsk to accelerate the Siberian timber traffic; and a new 240-mile line from Rubzovska, on the Novosibirsk—Semipalatinsk route, to the non-ferrous ore district centred on Ridder and Ust-Kamenogorsk.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Interavailability of Tickets

Eastern Bengal Railway,
3, Koilaghat Street, Calcutta,

March 13

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—With reference to the article on "Interavailability of Tickets" at page 281 of the issue of Friday, February 17, 1939, I would suggest the name "Airoserail" for the type of tickets suggested.

Yours faithfully,

C. H. WOOD,
Publicity Officer.

Coned versus Cylindrical Tyres

3, Onslow Avenue,
New Moston, Manchester 10,
March 11

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—Although there have been numerous references in THE RAILWAY GAZETTE to experimental work carried out in various parts of the world on the relative merits of coned and cylindrical tyres, so far as I am aware, nothing which has been published explains why less bogie hunting occurs with tyres having a cylindrical tread than with those having a coned one. If this is the case, the following explanation, which seems a reasonable one to me, may be of interest to you.

First let us assume we have a pair of wheels with tyres of standard coning (i.e., 1 in 20) running on rails correspondingly inclined. Unless both wheels are exactly equal in circumference and always roll centrally between the rails (which is clearly impossible), one wheel must inevitably roll on a slightly longer circumference than the other, which will tend to make this wheel get in front of the other so far as clearance in the axleboxes and guides will allow. In other words, the line of travel of the wheels becomes slightly inclined to the line of the rails, with the result that the wheels move over towards the side which had been rolling on the smaller circumference, until the flange comes in contact with the rail. The process is now reversed, the wheel which had previously been rolling on the smaller diameter now rolling on the larger, so that this wheel gets in front, and consequently the wheels move over in the opposite direction until the other flange strikes the rail.

If, however, the tyres have a flat tread it is clearly evident that the wheels will roll on equal circumferences no matter how they are disposed relative to the rails. There is no tendency, therefore, for one wheel to get in front of the other, except in so far as this may be caused by a difference in circumference due to lack of precision in the machining

of the tyres. Thus the cause of bogie hunting, if the foregoing argument is correct, is largely eliminated by the use of flat-treaded tyres. In practice I believe it is found that excessive flange cutting occurs on bends when a cylindrical tread is used, and after experimenting with various conings, a taper of 1 in 100 has been adopted as the most suitable.

Another interesting point is that with a flat-treaded tyre rolling on a track inclined at 1 in 20 (say), point contact between tyre and rail is obtained, as opposed to line contact with a coned tread. The intensity of pressure between tyre and rail must therefore be increased and it would be interesting to know whether this would have any effect on the rate of wear.

Yours faithfully,

A. S. GILLITT

The New Hiawatha Record

58, Rue de Courcelles,
Paris, (8e),

March 20

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—With reference to the run of the Hiawatha from Sparta to Portage, mentioned in THE RAILWAY GAZETTE of March 17, this is even better than 78.3 miles in 63 min. would suggest. Portage is at 817 ft. above sea level, and Sparta at 793 ft., so there is a nominal climb from end to end, but three miles from the start a grade is met comprising eight miles at 1 in 200 and two miles at 1 in 150, the summit being at an altitude of 1,070 ft.—277 ft. to climb. At the summit there is a tunnel 1,330 ft. long, the only one between Chicago and St. Paul. The last two miles on the grade and the tunnel are single track. There is a speed restriction to 40 m.p.h. through the switch at the end of the double track, after which the train has to recover up the 1 in 150.

Sixteen miles farther there is a slack to 50 m.p.h. (Camp Douglas, C. St. P. M. & O. RR. crossing). Still 30 miles farther a slack to 70 m.p.h. is in force, while at three other points speed is limited to 90 m.p.h. For about one mile before arriving at Portage there is a limit through the yards of 40 m.p.h. These various slacks cost at least 5 min. Picking up full speed and slowing down for the stop, from actual experience, takes also 5 min. and it will be seen that the schedule calls for normal speeds of 75-80 m.p.h. up the 1 in 200, and 95-100 m.p.h. everywhere else.

The load is at times 15 light cars = 700 tons (engine 4-6-4). The 4-6-4's, on slower trains, have hauled 26 standard cars (= 1,800 tons) at 70 m.p.h.

Yours truly,

BARON G. VUILLET

PUBLICATIONS RECEIVED

L.M.S.R. Enginemen's Mutual Improvement Class Papers, 1938. London: *L.M.S. Magazine*, Labour and Establishment Office, Euston station, N.W.1. 7½ in. × 9½ in. 16 pp., illustrated. Price 4d. post free.—In the foreword to the latest, 1938, collection in book form of enginemen's mutual improvement class papers, which have appeared individually month by month during the past year in the pages of our contemporary, the *L.M.S. Magazine*, Mr. D. C. Urie, Superintendent of Motive Power, L.M.S.R., emphasises that good enginemanship and workmanship necessitate a sound knowledge of the locomotive to be handled or repaired, and the articles in this booklet are a means to attaining that end. The 1938 articles treat the testing of valves and pistons; valve diagrams to show steam distribution; vacuum-controlled regulator; firebox sand gun; vacuum brake; mechanical lubricator and application to axleboxes; cylinders and piston valves; methods of securing locomotive tyres; application of speed indicators to modern locomotives; and pistons. The book concludes with a summary of L.M.S.R. locomotive stock up to and including November, 1938, giving the engine numbers, power classifications, whether saturated or superheated, and company of origin; a list of named engines; summary of railmotor stock, and a list of motive power depots with depot classifications.

The Canadian Railway Problem. By Leslie R. Thomson. London: Macmillan & Co. Ltd., St. Martin's Street, W.C.2. 10½ in. × 7 in. × 2 in. 1080 pp. Folding tables. Price £2 15s. net.—The controversy "Unification" versus "Co-operation," in Canada, is treated in this book, perhaps for the first time, from a neutral point of view, and the author, who is a well-known consulting engineer in Montreal, sums up the evidence and gives an unbiased opinion as to causes and remedies. The book itself, although necessarily voluminous, is written and arranged with clarity, and the first two chapters form a summary of the whole work. Much of the historical and statistical matter is based on the report of the Royal Commission of 1931-1932, but, of course, as the author says, Canada has had, since that date, several years' experience of the policy of co-operation. The present chaotic condition of transportation finance in Canada (it should not be supposed that it is transportation itself which is chaotic) is attributed in part to the failure to institute bankruptcy proceedings for the Canadian Northern and Grand Trunk railways. Then the author refers to "the inequity of competition between the Crown and a creature of the Crown" (the Canadian Pacific Railway), and remarks on the tendency in North America towards public ownership. The plans for reform, 18 no less, that

have been publicly proposed, are discussed, and the author finally recommends the establishment of a Dominion transportation authority, with regulating powers over all forms of transportation, while the two great railway systems under a "policy of common management," would be placed by their owners under a single board of directors, at least during a trial period of ten years. Meanwhile, a Royal Commission would report on the advisability of bankruptcy proceedings for the Canadian National Railways. The book is furnished with an excellent index.

Forstliche Rundschau der Zeitschrift für Weltforstwirtschaft. (Classified list of the world's literature on forestry.) Edited by Prof. Dr.-Ing. F. Heske, Prof. Dr. K. Abetz, and Prof. Dr. A. Röhl. Berlin and Neudamm: Verlag von J. Neumann-Neudamm. 9½ in. × 7 in. 272 pp. Paper covers. Price to subscribers to the Forestry Review, 12 RM., to non-subscribers 18 RM.—This volume is the first issue of a compilation listing the titles of publications throughout the world dealing with timber and forestry products generally. It covers works issued in 1937, and a second issue is promised which will cover the first half of 1938. The classification of the titles is by their division primarily into subject matter according to the Flury system, and secondarily on a geographical basis. The subject is of only indirect railway interest, and of over 6,100 entries, but 22 are indexed as having direct railway application; these refer to timber for railway sleepers. Some 96 entries headed "Land transport" relate to forest railways and timber transport generally.

Six Continental Fairs in March.—Details of the sample fairs being held this month in six continental cities, Basle, Brussels, Leipzig, Lyons, Prague, and Utrecht, are given in two publications which we have received from the Belgian Railways and Marine. One is a folder with a chart showing the dates of the fairs; it includes a diagram of the journey times between the above cities for the benefit of those who wish to make use of the special facilities for visiting two or more fairs in a combined journey. The other, an eight-page booklet devoted entirely to the Brussels fair, contains information which intending buyers will find very useful.

Continental Holidays.—We have received from Dean & Dawson Limited a selection of the firm's travel literature for 1939. "Holidays on the Continent" is a complete programme of tours, independent and conducted, to European holiday centres. A special feature is the "all-in" holiday, the quoted price for which covers, besides train fare and hotel accommodation, a variety of "extras." "Italian Train Cruises, 1939" is an attractive folder devoted

to the seventeen-day cruise by a special train which visits renowned Italian cities. "Easter Holidays, 1939" gives details of short Easter tours at home and abroad.

New Water-Cooling Units.—The Visco Engineering Co. Ltd., Croydon, has issued a catalogue describing and illustrating the firm's new Steelshell Forcedraft cooling units. Different types of apparatus to meet varying requirements are given. An advantage with these units is that they are economical in use, the water being re-cooled and used again after each operation. When they are indoors, or when their fan suction is connected to any room, they act as ventilators as well as cooling units. With modifications they may be used for cooling oil.

Electric Speed Indicators and Isothermos New Axleboxes.—One of two new brochures we have received from J. Stone & Co. Ltd., of Deptford, London, S.E., describes the Stone-Deuta electrically-operated speed indicator for locomotives, an apparatus, the result of much research and experiment, which consists essentially of a geared generator actuated by a driving wheel of the locomotive, and a dial in the cab, connected to the generator by electric cable. The other booklet is devoted to the firm's Isothermos axlebox, designed to give reliable service with little attention. The hydro-dynamic theory of lubrication is described in this booklet, and on other pages are given a complete description of the axlebox, particulars of performance tests, and details of maintenance. Diagrams and illustrations of the axlebox and its components appear, and included also are some excellent photographs of locomotives and rolling stock in service in many parts of the world, which have been fitted with Isothermos axleboxes.

Self-lubricating Bearings.—A new illustrated booklet, published by the Manganese Bronze & Brass Co. Ltd., of Handford Works, Ipswich, describes the applications to industrial purposes of Oilite self-lubricating bronze bearings. Oilite is a porous bronze material, impregnated with lubricating oil which is automatically exuded under load or heat generated by friction. For internal-combustion engines, these bearings are suitably applied to such mechanical parts as valve rockers, and magneto spindles. Similarly, they are particularly suitable for fractional horsepower electric motors, whether for fans or other duties, installed in places where silent running is essential. One page in the catalogue is devoted to the numerous examples of railway equipment for which Oilite bearings are suitable, instancing the moving parts, levers, and linkages involved in signalling mechanisms. Rolling-stock construction offers scope to the bearings in the lubrication of side radial blocks, centre-pin bearings, and brake rigging; while on locomotives they may be applied to motion pins, die blocks, reversing gear, and handbrake mechanism.

THE SCRAP HEAP

In T. Howard Somervell's book, "After Everest," the story is told of an Indian engine driver who became a Christian. Thinking that if a thing is English it must be Christian, he applied this misconception to naming his son. The little boy was duly called by one of the few bits of English that his father knew, and now rejoices in the name of "Engine Oil."

To a French-Canadian soldier—General E. de B. Panet—will fall the task of being responsible for the safety of the King and Queen during their Majesties' forthcoming visit to Canada. He is the Chief of the Canadian Pacific Department of Investigation, at Montreal, and will be responsible for all the police and protective measures while their Majesties are travelling across Canada in the royal train that is now being prepared. General Panet, who comes from a well-known French-Canadian family, went from the Royal Military College at Kingston (the "Sandhurst of Canada") to the Royal Canadian Artillery. Proceeding overseas with the First Canadian Expeditionary Force in 1914, he was six times mentioned in despatches, and awarded the C.M.G., D.S.O., as well as the Legion d'Honneur. He has acted as Aide-de-Camp to two Governor Generals, Lord Willingdon and Lord Bessborough.

TRAVELLING TUCK-SHOP AND CINEMA

A special L.N.E.R. train, conveying 250 boy scouts, will leave King's Cross on Easter Sunday night on a thousand-mile tour of England and Scotland. It will consist of sleeping cars, dining cars, and kitchens, and every scout will be served with three good meals a day prepared by expert restaurant car chefs. A tuck-shop, cinema coach, and recreation coach will also be provided. Monday will be spent at Carlisle with coach tours to places of interest; on Tuesday and Wednesday the train will stand at Banavie, at the foot of Ben Nevis; Thursday morning will be spent sailing on Loch Lomond; on Thursday evening a visit to Berwick-on-Tweed will be made; and Friday will be devoted to the more serious business of inspecting chemical industries and steel works at Middlesbrough. After spending Saturday by the sea at Whitby, the party will travel back to King's Cross during the night.

On August 4, 1914, while I was stationmaster at a South Wales railway station, I received a very oddly-worded telegram, which said:

Move heaven and earth to let me have three trains of empty coaches at Crewe by midnight to move troops to France.

It was the day after Bank Holiday, and although war rumours were current, every coach was in use. I quickly decided to unload passengers from three excursion trains and pack them

into three others which were already crowded. The passengers were reluctant to change, but I spotted an old friend of mine who was the double of Mr. Lloyd George. I whispered to him how things stood; he climbed on to a luggage truck and began to address the indignant crowd. So eloquently did he speak to them in English and Welsh, appealing to their loyalty and stressing the urgency of the occasion, that they cheerfully crushed themselves into the trains—filling the guards' vans and every spare inch; and so the situation was saved.—*From a letter by Mr. A. Aldridge, of Kenton, Middlesex, published in the "Evening News."*

A bridge across the Firth of Forth at Alloa Ferry was proposed as early as 1817, and in 1845 a prospectus was issued for its construction—capital £100,000 in £20 shares. Both efforts proved abortive, but the question was revived again in 1865 by the Caledonian Railway Company, finally to be abandoned in view of the North British scheme at Queensferry.

Mr. Frank Edwards, Goods Agent at the L.M.S.R. Burton-on-Trent depot, who retired on March 21, claims to have been responsible for the handling of more beer than any other man living. He used to deal with 2,000 tons (not pints) of beer a day, but he has never tasted a drop. "Make no mistake," he said in an interview, "I'm not a teetotaler. I don't happen to be a beer drinker, that's all." Mr.

Edwards is proud of the fact that he started in the very lowest grade on the railway. On being promoted to a clerical post, he set himself to learn shorthand—then in its infancy—and this qualification earned him the post of shorthand writer to the Agent at Burton in 1907. He had by that time a speed of 150 words a minute, entirely self-taught. Mr. Edwards has spent all his working life at Burton, and will continue to live there in his retirement.

When the dramatic society of the Bureau of Information on Nickel produced Arnold Ridley's thriller "The Ghost Train" on March 10, the programmes were externally copies (and on closer examination travesties) of the familiar covers of the "A.B.C." railway timetable. One page inside presented an imaginary train service, with map, enlivened by a lengthy column of notes including such references as "steep gradient, passengers walk"; "cold tea and burnt toast served," and "Nobody ever travels by this train anyway." Some of the advertisements on the cover were designed primarily for home consumption, but one need not be a member of the bureau's staff to appreciate the skit on a familiar Continental service slogan—"Have you tried the short sea route, Southend to Leigh-on-Sea." Selected comments on the production from the less familiar organs of the press included the following comment by Codfish Finn in the *Sunday Excess*—"My soul thrilled as I watched. Surely there is a lesson here somewhere, if we only knew what it was."

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10 MARCH 1939

PUBLISHED ANNUALLY

THE
A B C
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A DESCRIPTION OF THE VEHICLE OF MIRTH AND THRILLS PRESENTED AT THE RUDOLF STEINER STATION, 33 PARK ROAD, CLARENCE GATE, N.W., ON FRIDAY, 10 MARCH, 1939, AT 8 P.M.

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THE SHORT SEA ROUTE
HAVE YOU TRIED

B.B.C. NI-RESIST-BY-THY-SEA TO LITTLE CASTING B.B.C.									
WEEKDAY—MORNING					WEEKDAY—NIGHT				
MX	MO	TH	FR	SA	MX	SO	TH	FR	SA
NI-RESIST-BY-THY-SEA	2P50	23	9	55	1	15	8	17	9
Smasher-on-the-Nose	3	6	10	7	3	18	8	24	10
Middle Madcombe	3	17							10
Pollywack (N) Hall	3B25								10L47
Epom	4	1							11M12
Beacham (1)	4	18			5B25	9	8	11	11E26
Big Hoo	5	25	12	16					12F9
Little Hoo	6	1	12	48	6	20	10	4	12G17
Wormwood (A) Scrubs	6	45							12H36
Big (A) Hoo	7B20								10U17
Little (A) Hoo	9	7	2	50					
Seven Dials	9	15			3Q15				
Eight Bells	9	30							
Fal Vale	9	35							
Auchterbeggs	9	51							
LITTLE CASTING	10C15				1W15				

MX—Except Mondays
MO—Mondays only
SO—Saturdays only
SX—Except Saturdays
A—Loop Line (and what a loop)
B—Does not stop
C—Engine driver
D—Does not stop for breakfast
E—Registered Trade Mark
F—Nobody ever travels by this train anyway
G—Does not stop
H—Reverses here
I—Does not arrive
J—Not pronounced
K—Chalmersley
L—Cold tea and burnt toast served
M—Extra charge 7s. 6d.
N—Steep gradient
O—Passengers with
P—Change for Covent Garden
Q—Via Old Bailey
R—Not Monday
S—Not Tuesday
T—Not Wednesday
U—Not Thursday
V—Not Friday
W—Not Saturday
X—Not likely

IT'S
QUICKER TO WALK

Front cover and specimen page from the "A.B.C." programme to the production by the Bureau of Information on Nickel Dramatic Society of "The Ghost Train"

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

VICTORIA

Damage by Recent Bush Fires

The Government Railways suffered severe damage from the bush fires that ravaged the State during January. The timber viaduct between Noojee and Nayook, 295 ft. in length and 69 ft. high was reduced to a ruin of twisted rails and blackened trestle stumps. A road bridge over the line near Erica was also destroyed, and many small bridges on the Walhalla line were damaged. On the Heywood—Mt. Gambier line another wooden bridge, 180 ft. long and 36 ft. high, near Lyons, was destroyed, and many smaller bridges were damaged or destroyed on other sections of line. Wooden culverts, telegraph lines, cattle pits, and fencing also suffered severely. At Noojee all the railway buildings except one of concrete were reduced to ruins. The well-known tourist resorts "Hotham Heights," Mt. Hotham and "The Bungalow," Mt. Feathertop, were completely gutted.

Fighting the Fires

Parties of volunteer railwaymen were highly praised for their part in assisting the authorities in fighting fires at various points in the State, and in some instances food was provided by the Refreshment Branch and conveyed by car from Melbourne. Special trains were run to carry volunteers to the fire-front and also to evacuate refugees to special camps. A complete circus, cut off by the burning of a bridge on the Mt. Gambier line, was rescued from the nearest possible point by a relief train.

New Steel Air-Conditioned Buffet Cars

The first all-steel air-conditioned buffet car in Australia was placed in service on the Albury express on December 20. Named the *Wimmera*, this car has 27 sit-up cafeteria chairs upholstered in chrome leather, and ranged along a counter running the length of the car. Varied light meals and refreshments are available, and soups and other hot foods are heated by steam supplied from slow-combustion coke stoves; cold drinks and food are ensured by the use of an electric refrigerator. The internal decoration includes light brown rubber linoleum floor covering and tangerine chairs and window sills; the walls are shaded in cream. The exterior livery is red with silver lettering and bands above and below the windows from end to end, synthetic enamel being used for the whole of the body, including the roof which is also bright red.

The car was constructed at the Newport railway workshops, Melbourne, of Cor-ten steel, and is streamlined. It is carried on four-wheel welded bogies with roller bearings, and has auto-

matic couplers with rubber-mounted friction draft gear. Air brakes of the clasp type are operated by a single body-mounted cylinder. To eliminate noise and high frequency vibrations arising from the track, rubber pads or washers are used extensively in the trucks and springing and under the body, which is also insulated against the transference of heat, cold and noise. Air-conditioning equipment of the electro-mechanical type is utilised, the axle-driven gear box being mounted on one of the trucks. Illustrations of this fine vehicle will be found on page 514.

Grain Elevators

Of the 81 grain elevators, having a capacity of 9,365,000 bushels, that are to be built in the western and north-western areas, 30 are now being constructed. The wheat-proofing of trucks and alterations and additions to sidings at stations where the elevators will be situated are being carried out by the Railway Department. Already some 1,000 trucks have been adapted for the carriage of wheat in bulk. In addition, 500 trucks of a new and improved type are to be built for this traffic. The adaptation includes door fastenings to provide for sealing and small modifications in the construction of the body.

TASMANIA

Christmas and New Year Traffic

The Christmas and New Year Holiday traffic was unusually heavy and in marked contrast to that of the previous year, when all travel was interfered with by the prevailing infantile paralysis epidemic. Not only was the leeway made up as against the previous year, but a substantial increase upon previous figures occurred. It is considered that the introduction of the one-class fare, to which reference has already been made, contributed to the increase in the number of passengers carried.

Special Railcars for Tourist Parties

A feature of railway travel which is exploited to a considerable extent in Tasmania is that of running Sentinel-Cammell and diesel-engined single unit railcars for the accommodation of tourists. A party of visitors from the mainland States is booked up, a guide is appointed to travel with the party, all the necessary arrangements in regard to hotel accommodation, &c., are made in advance, and an inclusive fare is collected before the passengers leave their own State. A railcar is set apart for the use of the party, and practically the whole of the lines are traversed. Beauty spots not directly served by the railway are visited by road motorcar. These trips are becoming increasingly popular and the number run during the

present season has been in excess of those of previous years.

INDIA

Safety in Rail Travel

Referring to the outcry aroused by the numerous recent accidents on the East Indian Railway, Sir Thomas Stewart, Member for Railways, stated in his budget speech, that though convinced that the recent derailments were due to causes beyond control of the railway, the Government deplored them none the less. At the same time, he reminded critics of the past record of the Indian railways in respect of safety, for the quinquennium ending March 31, 1938—a period which included one of the most disastrous accidents in Indian railway history—deaths resulting from railway accidents amounted to only one in every 17 million passengers carried. This figure compared favourably with that for any other country, and the Railway Member asked if any other form of transport could claim as much. He further referred critics to the illuminating though distressing statistics of road accidents set out in the Roughton Report on Motor Insurance.

Government Inspectors

Turning to a motion suggesting the undesirability of Government Inspectors being under the control of, or expecting preferment from, the Railway Board, and recommending the establishment of a cadre of special officers under the Department of Communications for accident investigation purposes, Sir Thomas did not regard as valid the criticism that, because Government Inspectors were subordinate either to the Railway Board or the Government of India, their inquiry reports did not carry conviction. Nevertheless, in deference to the wishes expressed by many speakers, and in view of the fact that the Government of India Act contemplated the creation of an independent body of inspecting officers in the future, the Railway Member had asked the Railway Board to put up for his consideration proposals for bringing into existence a self-contained cadre of investigating officers responsible not to the Railway Board but to the Government of India.

Manufacture of Locomotives in India

The demands for railway grants under the various budgetary heads produced lively debates in the Central Assembly on cut motions, many of which were carried. The attempt to censure the Government on the vague charge of failure to adopt a long term financial policy in respect of railways was defeated after the Railway Member had explained the Government policy in regard to railway finances. A successful cut motion, however, voiced the non-official opinion on the

desirability of manufacturing railway locomotives in India, though Sir Thomas Stewart pointed out that in the motion no case had been made to show whether or not the manufacture of locomotives would be a commercial proposition. The Government had investigated the question very thoroughly on various occasions, and was not satisfied that the enterprise would be economically sound.

CANADA

Lines Closed and Lines and Bridges Opened During 1938

The Chief Engineer to the Board of Transport Commissioners reports that four sections of line were closed and two opened for traffic during 1938. The four lines closed were all the property of the Canadian National Railways, namely, (1) a 22.3 mile section of the La Tuque Subdivision between Domburg and St. Marc, Quebec; (2) 8.4 miles of the Batiscan Subdivision, in Quebec; (3) a length of 17.9 miles of the Freleighsbrough Division; and (4) 35.4 miles on the North Lake Subdivision, near Mackie's, Ontario.

In British Columbia the deviation of the Canadian Pacific Railway between mileage 99.4 and 101.8 on the Mountain Subdivision has been opened for traffic, and on the C.N.R. the new 100-mile loop line from Val d'Or to Noranda was formally opened during the year. Also 30 new or reconstructed bridges have been completed on both railways during the year, and 11 new underbridges have been constructed in various parts of Canada.

Long Engine Runs

The remarkably smart and well-kept appearance of the 4-6-4 and 2-10-4 Canadian Pacific Railway locomotives is noted by a correspondent who recently had occasion to travel from Toronto to Vancouver and back. One engine worked his train right through from Calgary to Winnipeg, a distance of 830 miles, and another one from Fort William to Toronto, 813 miles. The temperatures throughout were below zero, sometimes as much as 52° below, and the depth of snow varied from 1 ft. to 10 ft. for at least 1,500 miles, yet arrival at Toronto was only 4 min. late. At the divisional points, where 15-min. stops were made, the lower parts of engine and tender appeared to be a mass of caked ice, and that these engines stood up to such long continuous runs in such weather conditions was remarkable.

HOLLAND

Signalling on the Netherlands Railways in 1938

The Signal Department of the Netherlands Railways, under Mr. H. J. Van Aalderen, was very busy last year. Several new, and a large number of modified signalling installations, were

brought into use. Some block posts were abolished and the modification to the signals, in progress for some years, extending the use of bracket type junction signals and 3-aspect distant in rear was continued. Further stations were equipped with distant signals repeating the starting signals, found especially useful where fast trains run. Distant signals are being moved out to a distance of 1,000 m. (1,094 yd.) from their home signals on lines where speeds up to 125 km.p.h. (77.6 m.p.h.) are allowed. The replacement of the normally-free lock-and-block found on the old Holland Company's lines by the normally-locked pattern, long used by the former State Railway Company, was continued, and d.c. track circuits were replaced by a.c. on certain electrified lines. Additional automatic level crossing warnings were installed and also some—on secondary lines—operated by the guard after stopping. The telephone system was extended and improved and four new exchanges brought into use with amplifying apparatus in one case.

KENYA & UGANDA

Tonnage and Train-Mileage in 1938

The Kenya & Uganda Railways & Harbours, including branch lines, marine, and motor services, handled the following tonnages during 1938, and these results are compared with those for 1937 below:—

	1937 Tons	1938 Tons	Increase Tons	Per cent.
Total export traffic received at coast	400,749	432,394	31,645	7.90
Total import traffic railed from Kilindi	169,304	174,785	5,481	3.24
Total traffic dealt with	995,187	1,035,337	40,150	4.03

The total train-mileage run during 1937 was 2,690,587, whereas during 1938 it rose to 2,700,968, an increase of 10,381 miles, or 0.04 per cent.

GERMANY

Co-operation Between Private Railways

As part of the re-organisation of transport facilities now proceeding in Germany, much attention is being paid to promoting closer co-operation between the various private railway undertakings, which total some 14,000 km. (8,700 miles), a considerable figure for a country that has so long and completely accepted the State railway régime. This co-operation is being pursued not merely in technical matters, but in all branches of railway operation. Conferences and lectures on traffic working and commercial management are being held, and every encouragement is given to make the experience of the various concerns mutually available. In October last a meeting was held at Essen under the chairmanship of Herr Wehrspann, who has taken a

great part in the movement to further the fortunes of the private lines. In an interesting opening address he dwelt on the new policy, the desire to increase the efficiency of the staffs of the private lines and the promotion of a fuller pride in their work.

Czech Passenger Traffic

All passenger rail traffic across the German frontiers into the States of Bohemia, Moravia, and Slovakia is suspended for the time being. The "privileged train" services Berlin—Vienna, Breslau—Vienna, via Zauchtel and Mittelwalde respectively, are operating as usual, but passengers using these trains cannot alight in Moravian territory.

MANCHUKUO

New Railway Opened

A new branch line 47.7 km. in length from Kingcheng to Tiehli (Tieshanpaol), in a direction eastwards from Suihua and north-east of Harbin, has been opened for public traffic. It taps an area of very fertile soil and forests.

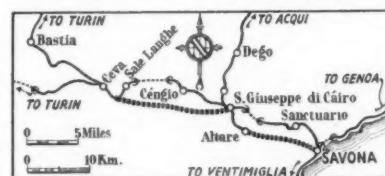
Increase in Capacity of Hulutao Port

As mentioned in THE RAILWAY GAZETTE at the time, the South Manchuria Railway decided in 1935 to spend some Y. 20,000,000 (over £1 million) on the development of Hulutao harbour in order to increase its capacity to 3,500,000 tonnes annually; the expenditure was to be spread over five years. A revised scheme now anticipates a capacity of 4,000,000 tonnes and an additional expenditure of Y 10,000,000, and permits of the completion of three new piers, with a capacity of 1,000,000 tonnes, during 1939. The entire project is scheduled for completion in 1940.

ITALY

Improvement of Savona-Turin Connection

The present line from Savona to San Giuseppe di Cairo, towards Turin, suffers from severe curves and gradients. In 1922 a new line between these points was begun and the formation built.



Sketch map showing relief lines between Savona and Ceva

It runs through Altare, whence there is an existing branch to San Giuseppe. This line, it has now been decided, is to be completed, and will greatly improve the connection with Turin, especially if the proposed relief line between San Giuseppe and Ceva is also constructed.

WINTER SPORTS ATTRACTIONS IN SWITZERLAND

Extensive provision of ski-lifts and ski-funiculars at Alpine resorts

One of the latest methods of attracting winter sports enthusiasts to the various ski-ing resorts in Switzerland is the provision of ski-lifts or ski-funiculars to carry them and their skis up to the tops of the ski runs.

The present winter sports season has witnessed the inauguration of a number of new ski-lifts and ski-funiculars—as mentioned in our Overseas columns of February 3—and now, thanks to the Federal Traffic Department, we are able to give complete lists of installations of these two forms of transport in Switzerland. Also we publish a map showing the resorts where winter sports enthusiasts are catered for by the provision of these or of ordinary adhesion, rack or cable lines.

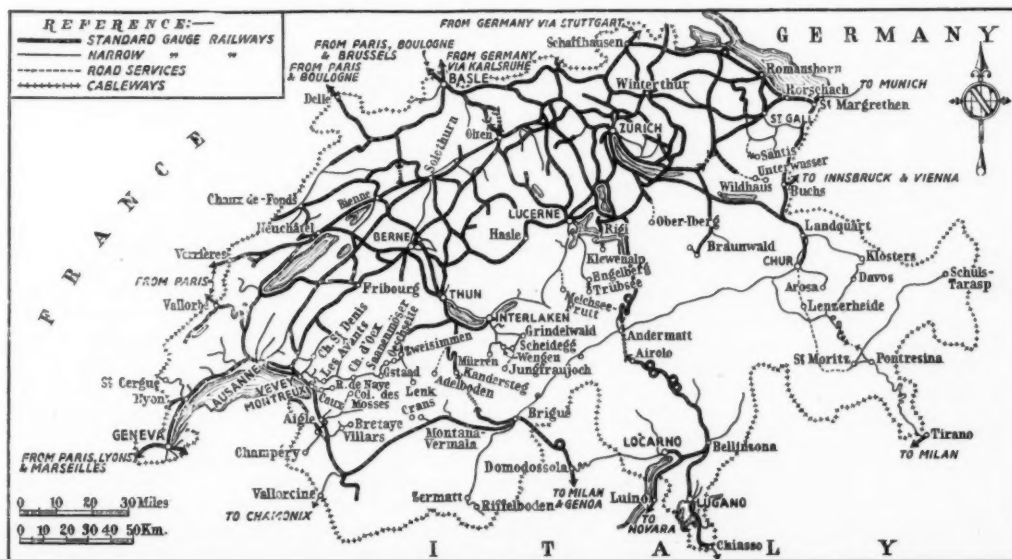
SKI-LIFTS IN SWITZERLAND

Line	Length metres	Rise metres
Andermatt-Nätschen-Gütsch	780	314
Arosa-Tschuggen	896	292
„ —Carmenna	1,256	321
„ —Weishorn	1,820	380
Châtel-St. Denis-Corbetta	925	305
Davos-Bolgen	300	60
„ —Schatzalp-Strela I	607	227
„ — „ II	1,263	236
Fribourg-La Berra	550	156
Klosters-Selfranga	716	168
Montana-Vermala-Mont		
Lachaux	2,400	620
Mürren-Schiltgrat	1,215	479
Ober-Iberg-Moosegggen	1,209	415
Pontresina	372	95
Rochers de Naye	340	110
St. Cergue-Tabanion-Pétroulax	758	184
St. Moritz-Suvretta-Piz Nair I	800	260
St. Moritz-Suvretta-Piz Nair II	1,400	464
Villars-Bretaye-Chaux-Ronde	360	130

SKI-FUNICULARS IN SWITZERLAND

Line	Season opened	Length (metres)	Rise (metres)	Max. gradient %	Traction*	Speed (m. per sec.)	Cars	Seats per car
Chorecrans	1924/5	409	87	42	Elec. U.	1.6	1	17
Crans	1930/1	635	136	34	Elec. U.	1.6	1	23
Gstaad								
Windspillen	1936/7	1,072	245	42	Elec. L.	2.4	2	15
Oeschseite								
Rinderberg	1936/7	1,050	301	55	Elec. U.	2.1	2	18
Saanenmöser (Lochstafel) Hornberg	1936/7	1,003	217	38	Elec. U.	2.3	2	15
Adelboden								
Hahnenmoos I.	1936/7	898	140	30	Diesel L.	2.3	2	18
Hahnenmoos II.	1936/7	741	105	30	Diesel U.	2.3	2	18
Lenzerheide								
Tgantieni	1936/7	1,256	228	50	Elec. L.	2.3	2	15
Saanenmöser								
Hühnerspiel	1937/8	435	85	50	Petrol U.	1.8	1	10
Villars (Bretaye)								
Chamossaire	1937/8	1,058	286	62	Elec. L.	2.3	2	19
Braunwald								
Braunwaldalp	1937/8	1,211	257	60	Elec. L.	2.5	2	16
Wildhaus								
Oberdorf	1937/8	803	213	62	Elec. L.	2.6	2	15
St. Moritz								
Corviglia-Piz-Nair	1937/8	880	165	53	Elec. L.	3.0	2	19
Gstaad-Eggli	1937/8	1,245	510	75	Elec. L.	2.5	2	16
Lenk-Balmen	1938/9	878	349	67	Elec. L.	2.1	2	16
Airolo-Culiscio	1938/9	840	345	100	Elec. U.	2.0	1	14
Saanenmöser								
Hornberg I	1938/9	1,270	275	45	Elec. U.	3.0	2	24
Hornberg II	1938/9	1,433	242	43	Elec. L.	3.0	2	24
Adelboden								
Wintertal	1938/9	680	256	60	Diesel U.	2.0	2	9
Grindelwald-Bodmi	1938/9	395	67	54	Elec. L.	2.5	2	15
Col des Mosses	1938/9	1,179	188	60	Petrol C.	—	1	22
Hasle-First	1938/9	950	335	60	Elec. L.	2.5	2	17
Unterwasser								
Ilitios-Stöfeli	1938/9	1,285	359	60	Elec. L.	3.0	2	24
St. Cergue-Dôle	1938/9	1,280	300	60	Petrol C.	—	1	28

* L. = motor at lower station; U. = at upper station; C. = on car



Sketch map of Switzerland, showing winter sports resorts at which there are ski-lifts, ski-funiculars, or ordinary adhesion, rack, or cable lines

PROBLEMS CONNECTED WITH LOCOMOTIVE DESIGN—II

*Presidential address to the Institution of Locomotive Engineers by
Mr. W. A. Stanier, Chief Mechanical Engineer, London Midland & Scottish Railway**

THE problems which affect locomotive availability are not confined to design, but good design is essential to provide a basis of reliability on which the operating department may build in order to obtain greatest availability. Freedom from casualties and maximum time between routine repairs and attention are the principal requirements, and it is often the case that detail design which promotes the one will promote the other.

Axleboxes

While at first sight it would appear an easy matter to ensure that the bearings on which an engine runs should remain trouble free, hot boxes have at all times presented a problem, and they still exist to trouble us. The goal to be sought is their total elimination, and that good progress is being made can be instanced by the fact that 1,096 engines of six different types all having the same general design of axlebox although varying in actual dimensions ran through 1938 with a total of 89 casualties due to coupled wheel hot boxes. This, put another way, represents the probability of a hot coupled box failure on any given one of these engines as once in 12 years. This can be regarded as either a good result or a moderate one according to how it is viewed. From the viewpoint of our goal of total elimination it leaves something to be desired, and it will be interesting to examine the design from this point of view.

Fig. 4 shows the particular coupled axlebox design to

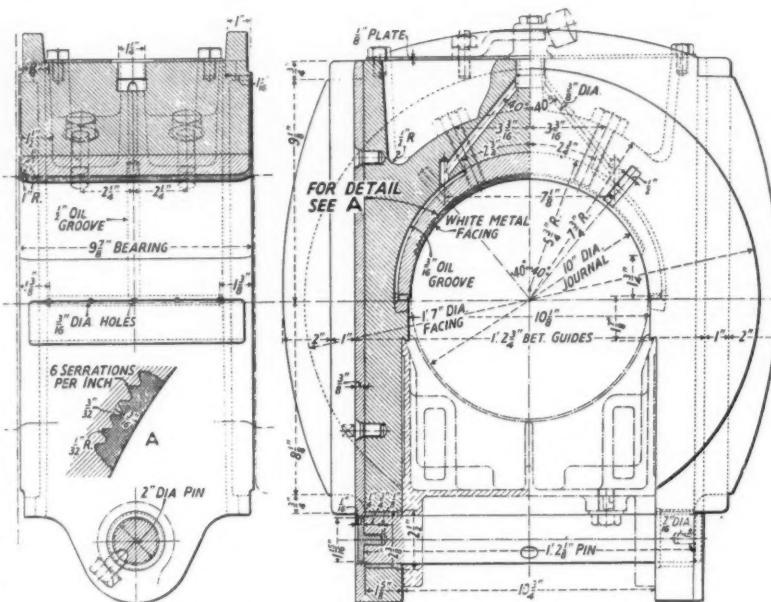


Fig. 4—Details of axlebox for coupled wheels, L.M.S.R.

in order to avoid breaking down of the oil film. Secondly, two means of lubrication are provided, (a) by mechanically fed oil introduced at about the horizontal centre line of the bearing—this is carried by the rotation of the journal up the wedge shaped clearance indicated in Fig. 4 to the actual bearing surface—and (b) by oil supplied by an underpad of liberal dimensions which is fed from a withdrawable underkeep.

TABLE A—LOCOMOTIVE AXLE BEARING PRESSURES

Engine	Axle	Axle Load	Weight of Wheel, Axle, &c.	Load on Journals 2 P.	Length of Axlebox	Dia.	Length Less Radii	$\frac{P}{l \times d}$ lb./sq. in.
Coronation 4-6-2 No. 6220	Driving	T. c. q. 22 6 0	T. c. q. 4 11 1	T. c. q. 17 14 3	in. 9 $\frac{1}{2}$	in. 10	in. 8 $\frac{1}{2}$	237
	Bogie	11 5 0	1 2 0	10 3 0	10 $\frac{3}{4}$	6 $\frac{1}{2}$	10 $\frac{7}{16}$	161
	Radial	18 10 0	1 15 0	16 15 0	12 $\frac{3}{4}$	7 $\frac{1}{2}$	11 $\frac{7}{8}$	210
2-8-0 Freight	Driving	16 0 0	3 14 2	12 5 2	10 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{3}{32}$	158
5X 4-6-0 passenger	Driving	20 5 0	4 14 0	15 11 0	10 $\frac{3}{4}$	9	9 $\frac{3}{8}$	207
	Bogie	9 15 2	1 5 1	8 10 1	10 $\frac{1}{8}$	6 $\frac{1}{4}$	10 $\frac{7}{16}$	146
Class 5, 4-6-0 mixed traffic	Driving	17 18 0	4 5 3	13 12 1	10 $\frac{7}{8}$	8 $\frac{1}{2}$	10 $\frac{3}{32}$	175
	Bogie	8 14 2	1 5 1	7 9 1	10 $\frac{1}{8}$	6 $\frac{1}{4}$	10 $\frac{7}{16}$	128

which I refer and it will be seen that certain features stand out. First of all the actual bearing consists of a pad of whitmetal which is unbroken by any oil holes or grooves

* In our issue of February 24, we summarised and commented upon the presidential address presented to the Institution of Locomotive Engineers by Mr. W. A. Stanier. The full address is reproduced by permission in this series of articles, the first of which appeared in our issue of March 17, with illustrations representing some of the lantern slides shown during the actual reading on February 22

The pad of whitmetal is kept thin and is keyed to the brass by means of the serrations shown. Lubrication between the face of the box and the wheel hub is effected by felt pads let into the side of the underkeep and lubricated therefrom by means of small oil holes. The object of all these arrangements is to avoid as far as possible temporary breakdown of the lubrication between any of the rubbing surfaces.

An essential of any good axlebox is that it should be

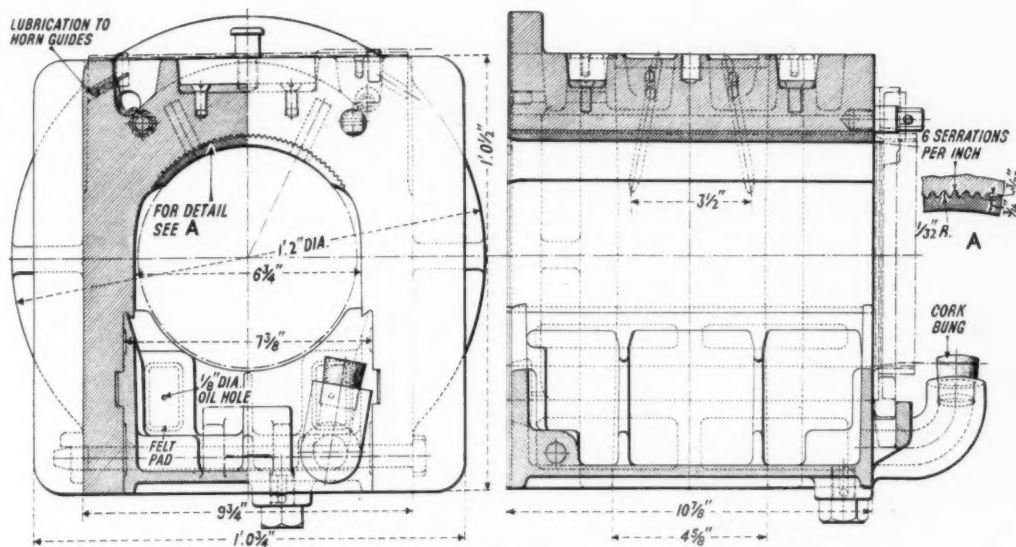


Fig. 5—Axlebox used for bogie and pony trucks, L.M.S.R

robust and of ample size for the load to be carried, characteristics in which many of the older axlebox designs fell short. Table A gives bearing pressures on modern axleboxes in which it will be seen that moderate values are aimed at.

Fig. 5 shows a type of axlebox used on both bogies and pony trucks. As these are carrying wheels, underfeed lubrication only is sufficient, and the same features of unbroken bearing surface, ample pad and underkeep size, and lubrication of wheel hub are to be observed. In the same numbers of engines of modern design above referred to, *viz.*, 1,096, this design of axlebox has provided eight casualties due to heating in 1938.

The problem of eliminating even those cases of hot boxes which occur is largely a matter of still greater care in manufacturing, further refinement in design, and of effective dust shielding. This last is the major remaining problem in this connection, and although countless types have been evolved, none can really so far be said to be 100 per cent. effective, especially when it is realised that keeping dust and grit from between the wheelboss and the axlebox face is equally important as shielding the opposite face of the box.

Fig. 6 shows a simple design of dustshield consisting of a hemp rope enclosed in a casing which is used on the inner faces of axleboxes, and although simple, it is reasonably effective for the conditions of this country where dust is not a major problem.

Adequate shielding between wheel boss and axlebox face is a much more difficult matter. Not only must a shield

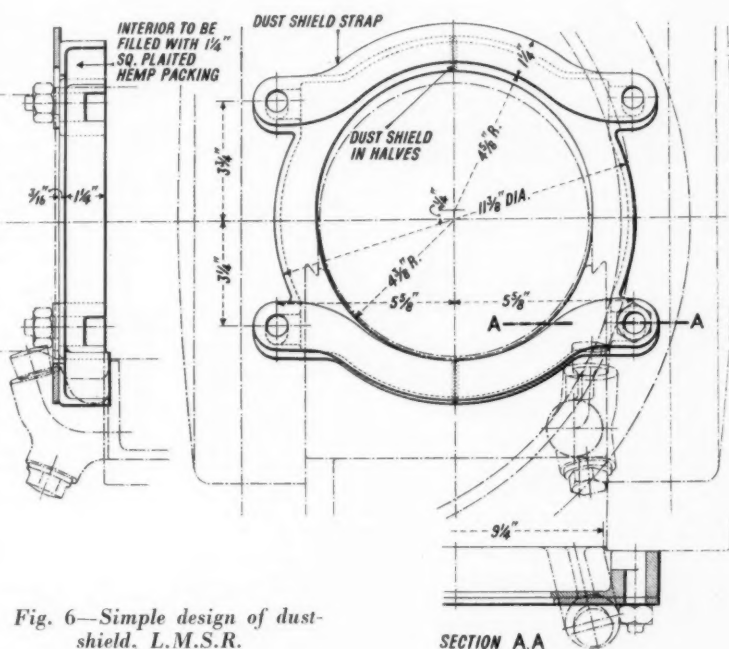


Fig. 6—Simple design of dustshield, L.M.S.R.

at this point be able to accommodate itself from conditions of nominal clearance to those of maximum lateral wear, but so important is a large bearing surface on the side of the axlebox that the shield must avoid encroaching on this surface. This problem has not yet been satisfactorily solved.

(To be continued)

TERMINAL MARKINGS FOR ELECTRICAL MACHINERY AND APPARATUS.—The British Standards Institution has recently published standard recommendations for terminal markings for electrical machinery and apparatus, based on a report issued by the British Electrical and Allied Manu-

facturers' Association in 1930. Copies of this publication (British Standard No. 822-1938) can be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1. The price of the volume is 7s. 6d. net, or post free 8s.

NORTHAMPTON'S FIRST RAILWAY

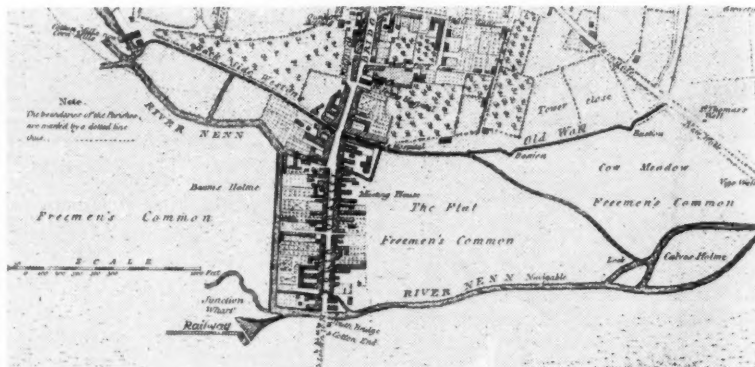
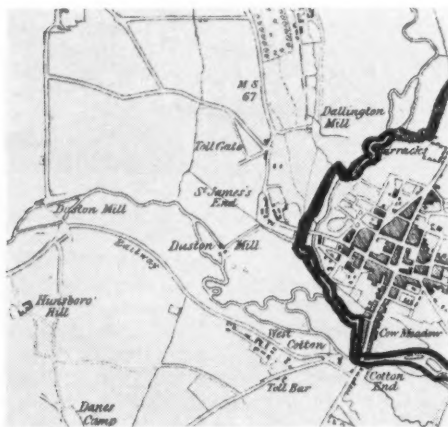
Was it Britain's one and only "Railway-road"?

By KENNETH BROWN

MISS JOAN WAKE in her pamphlet "Northampton Vindicated" (1935), has very effectively combatted the charge made against the town of Northampton of having by its opposition kept the main line of the London & Birmingham Railway from its door, a charge which has been so oft-times repeated that it has even

comply with the mandatory provision to that effect in the Grand Junction Canal Act of 1803 (43 Geo. III cap. 8), but the Report of Thomas Telford dated May, 1805 (quoted in THE RAILWAY GAZETTE of March 3) shows that it was still a few months off completion.

On August 31, 1805, the most which the *Northampton*



The old Northampton railway shown (above) on a plan of 1807 and (left) on a map of 1832

percolated into Blue Books. As against, however, a thousand people who "know" that Northampton kept the London & Birmingham Railway at bay, I doubt whether if THE RAILWAY GAZETTE had not referred to the fact in its issue of March 3 last, there would be one that knew that Northampton in fact had a railway (of the horse-drawn variety of course) made by the Grand Junction Canal Company as early as the first decade of the nineteenth century.

This first railway was about 5 miles in length, extending from Gayton on the canal near Blisworth to a terminus at Northampton just south of the River Nene near the South Bridge at a position shown on the plan of Northampton published by Vernor, Hood & Sharpe (of Poultry) on August 1, 1807, and included in the firm's "British Atlas" of 1810. Its course out of Northampton is shown on the plan of Northampton included in "Plans of the Cities & Boroughs of England & Wales" published by Robert K. Dawson in 1832, by which time the plan was in fact out of date as the canal had by then superseded the railway. At its other end (according to Mr. Christopher A. Markham) the railway ran from Gayton wharf for $\frac{1}{4}$ mile along the Milton Road, and thereafter followed the course of the present canal on the east side on or near the present towpath.† This railway ought to have been completed before March 25, 1805, so as to

Mercury could say was that "the branch and iron railway which are to connect the Grand Junction Canal with the river at this town . . . are proceeding with great spirit and their completion may now be expected about the end of next month." This prophecy was fulfilled, since the *Northampton Mercury* of Saturday, October 5, 1805, said: "We understand that the branch and iron railway, which are intended to connect the Grand Junction Canal with the river Nine at this place . . . will be opened on Monday next. A large attendance of gentlemen is expected." The line being thus opened on Monday, October 7, 1805, the advertisement headed "Canal Conveyance" in the *Northampton Mercury* of October 12, 1805, whereby "George Osborn informs his Friends and the Public that he has on sale Wednesbury Coals Coke & Slates at the Rail Road Wharf in Cotton End" superseded the similar advertisement appearing the week before when he announced that he intended so to do at the said rail-road wharf "which is expected to be open next week."

The railway was superseded by the branch canal covering the same point to point course opened on May 1, 1815. On that opening day which was "remarkably fine a great multitude of persons assembled to witness the first arrival of the boats which were laden with various kinds of merchandise. . . . After mooring the boats amidst the firing of canon ringing of bells etc. different parties spent the remainder of the day with the utmost conviviality."*

From Priestley's "Historical Account of the Navigable Rivers Canals and Railways of Great Britain" (1831) we learn of this railway that it was "a double railway allowing carriages going different ways, to pass without interruption." The story of the railway is not without

* Compare "I have said it thrice. What I tell you three times is true." Lewis Carroll: "The Hunting of the Snark," Fit 1, The Landing.

† "The Iron Roads of Northamptonshire," by Christopher A. Markham (Northampton, 1904). In this paper, which is reprinted from the journal of the Northamptonshire Natural History Society & Field Club (Vol. XII, part 99), Mr. Markham also records: "Mr. Fletcher of Hardingstone states that he well remembers, when this canal was drained about the year 1824, he saw some of the old tram lines lying in the mud near the road from Dunston to Hunsbury Hill."

* See the "Northampton Mercury" of May 6, 1815

interest; the Grand Junction Canal Company's initial Act of 1793 (33 Geo. III cap. 80) was for

"a collateral cut for the navigation of boats barges and other vessels to branch from and out of the said Canal in the parish of Gayton aforesaid in, to and through the several Parishes Townships or Places of Gayton, Rothers Thorpe, Wootton, Hardingston, Duston, and Northampton to join the present Navigation of the River Nen there."

Notwithstanding the definite provisions of the first Act, the company's Act of 1803 (43 Geo. III cap. 8) recites the powers as regards the Northampton branch as being to make "collateral communication by such cuts *railways* or other ways and means as therein mentioned," and the new Act directed that such collateral communication should be completed on or before March 25, 1805, and that out of the capital

"authorised to be raised by that Act a sum sufficient to defray the charge and expense of making and completing such collateral communication from the Grand Junction Canal in the parish of Gayton to join the navigation of the River Nen at the town of Northampton shall be . . . appropriated and applied solely and exclusively to the making and completing the said last mentioned collateral communication."

The Burgesses of Northampton however were not at all inclined to treat the making of a railway as being a compliance with the original Act, and in October, 1809, the Corporation passed the following resolution:—

"That this assembly has observed with regret a railway substituted for a canal by the Grand Junction Company, a mode of communication equally as injurious to this Town and Neighbourhood as to the Canal Company, experience having fully proved it to be inadequate for the purpose intended inasmuch as the articles that are conveyed along it are unavoidably subject to great waste breaking and Pilferage the communication is much more difficult and expensive than it would have been by water and nearly all perishable articles of Merchandise are prevented from passing along it."*

* See "The Records of the Borough of Northampton" (1898), vol. II, page 548.

The record of the proceedings also called attention to the fact that there had been an Act "16 years before" for making a branch canal to Northampton.

When in 1805 the Grand Junction Company obtained powers (45 Geo. III cap. 68) to charge increased tolls of a farthing per ton per mile (except for timber, coal, and certain other specified heavy freight) it was enacted that it should not be lawful for the company to ask or receive any such additional tolls in respect of goods

"which shall be carried or conveyed . . . over the whole length or any part of the Railway-Road or collateral communication leading from the Grand Junction Canal in the Parish of Blisworth in the County of Northampton through the Parishes of Gayton, Rothers Thorpe, Milton, Wootton, and Hardingstone or otherwise to join the River Nine or Nen at or near the Town of Northampton, so long as the said Railway-Road or any part thereof shall be made use of for and as such collateral communication, on which shall be carried goods etc. etc. from the Grand Junction Canal in Parish of Blisworth aforesaid to the said River Nine or Nen and until the said Company of Proprietors shall cause the said collateral communication to be made and completed for the conveyance of goods etc. etc. the whole length thereof, by and upon Water and not by any other means whatsoever, anything in this Act contained to the contrary notwithstanding."

This Act would seem to show that although the railway had been directed to be completed by March 25, 1805, as if it were a compliance with the provisions of the first Act, the making of a branch canal was still contemplated when the 1805 Act went through on June 27, in that year, four years before the resolution of protest by the Northampton Corporation. The last quoted Act at any rate endowed the English language by Statute with the word *Railway-road*, a hyphenation which has been unquoted in the Oxford "New English Dictionary." Can any reader of THE RAILWAY GAZETTE furnish a duplicate specimen of its use? Until one does I claim for the first Northampton railway the title of "Britain's one and only railway-road."

Butt-Welding of Rails by Oxy-Acetylene

THE New York, New Haven & Hartford Railroad has recently welded into 800-ft. lengths the rails of the four main tracks through its passenger station area at Hartford, Conn., with the object of reducing noise and vibration. The rails are of 112-lb. A.R.E.A. section in 34-ft. and 39-ft. lengths. The welding was done by the Oxweld automatic pressure rail welding process, which involves essentially the uniform heating of abutting rail ends to a temperature of about 2,280° F.

Specially designed equipment is used, with a mechanically oscillated welding head that applies heat evenly from oxy-acetylene jets to the rail sections from all directions. Simultaneously with the application of heat the rail ends are forced together under a pressure of 2,500 lb. per sq. in., which causes a shortening at each weld of $\frac{3}{4}$ in. due to the upset. The welds are subsequently normalised by uniformly heating them to about 1,380° F. and then allowing them to cool in the atmosphere. The reheating is done with welding heads similar in design and arrangement to those used in the welding process. Prior to welding the rail ends are ground accurately and so as to make them perfectly clean. Immediately afterwards, the welding upset metal is removed by a machine-guided oxy-acetylene cutting blowpipe, and immediately subsequent to the normalising process the joint is ground to give the rail correct profile. In the work on the New Haven line all operations were performed on a string of

flat cars on which the necessary equipment is mounted.

The welding head consists essentially of four blocks placed above, below, and on each side of the rail, and each containing a series of oxy-acetylene nozzles. Thus the abutting rail sections are practically encircled by jets in a plane perpendicular to the rails. The welding head is suspended from a track-mounted carriage which is oscillated backwards and forwards longitudinally by means of a shaft from an oil cylinder. Both the length and rate of oscillation are adjustable, and on the New Haven work the machine was normally adjusted to give a 3-in. movement of the welding head at 40 cycles a minute.

Intensive laboratory tests were conducted with specimens taken from the welds, and representative results showed that the metal of the butt-weld had a yield strength of 70,000 lb. per sq. in. and a tensile strength of 135,000 lb. per sq. in., with an elongation of 9 per cent. Tensile impact tests with specimens 0.236 in. in diameter showed an elongation of 9.5 per cent. under a load of 107 ft.-lb. In one series of tests it was reported that of a total of 20 specimens tested, 19 broke at points other than at the weld. In a rolling load fatigue test, with a welded rail supported as a cantilever, a load of 50,000 lb. was rolled backwards and forwards across the joint through 2,000,000 cycles without causing a failure. Full details are published in our American contemporary, *Railway Engineering and Maintenance* for January, 1939.

ELIMINATING HAMMER BLOW

Tests in India to determine the impact effects on bridges due to locomotives with 66 per cent. of the reciprocating parts balanced as compared with locomotives of the same type with none of the reciprocating weights but all revolving weights balanced

(From a correspondent)

DURING 1938, a series of interesting trials was carried out on the Madras & Southern Mahratta Railway, to compare the impact effects on bridges of engines normally balanced for the reciprocating parts, and similar locomotives rebalanced for "nil" reciprocating parts. The tests were conducted with "XB/1" class Pacific and "W" class engines on the broad gauge, and "YC," "P," "M," and "G" classes on the metre gauge. The normal "XB/1" locomotive is balanced for 66 per cent. reciprocating parts, distributed equally between the leading, driving, and trailing coupled wheels.

The majority of the test runs were made at 60 m.p.h. on the broad gauge, at which speed the hammer blow at the driving wheels of a normal "XB/1" engine is 3.07 tons and at the leading and trailing coupled wheels 3.12 tons. Combining the wheel hammer blows, the resultant axle hammer blows are each equal to 3.68 tons in phase with each other. The locomotive hammer blow at 60 m.p.h. is 11.04 tons, which is 21.6 per cent. of the weight on the coupled wheels (51.1 tons) and 7.0 per cent. of the weight of the whole engine and tender in working order (157.4 tons).

Rebalanced locomotives have the symbol "R" added after the class designation and a number indicating the percentage of the reciprocating parts balanced. A normal "XB/1" when rebalanced for "nil" reciprocating parts becomes an "XB/1/RO."

To rebalance the engines, holes were drilled in the crescent balanced weights, weights of metal equivalent to the calculated out-of-balance masses being taken out. Collars, which in equivalent weight correspond to the weight of the side rods, connecting rods, &c., were attached to the crank pins, and each pair of wheels was mounted on roller bearings. One or more of the extra holes in the crescents were then filled by trial and error, until the revolving parts were balanced. Some doubts were felt concerning the accuracy of this method, as unless the wheels are rotated at speed, it could not be ascertained which wheel was out of balance. For this reason, a dynamic balancing machine is under construction, which will give more accurate results.

The train used in the tests consisted of one or two empty bogie coaches coupled between an "XB/1/RO" and an "XB/1" engine. As the two engines were coupled, the speed factor was eliminated and the resulting impacts were more readily comparable. The results were obtained by

an ingenious deflectometer, designed and made in the engineering workshops of the railway, supported by stress recorder readings on an extensometer.

Tests were carried out on broad gauge spans ranging between 12 ft. and 130 ft. In the shorter spans, the deflections were so small that the results could be taken as only approximate. But, in the larger spans—60 to 130 ft.—a very marked resonance effect was obtained under the "XB/1" which was not noticeable under the "XB/1/RO."

Results Achieved

The experience on the M. & S.M.R. points definitely to the conclusion that "RO" locomotives run just as steadily, are no more prone to wear and tear, and from the maintenance point of view are at no disadvantage as compared with ordinary engines. The advantage to the bridge engineer and the permanent way engineer is obvious. Instead of a rapidly-changing, pulsating, load which bridges and track are called upon to resist, they have to carry no more than a steady rolling load, together with such lurch and track effects as are inevitable in practice.

The result of these tests is likely to have far reaching effects and, if satisfaction continues to be accorded by the mechanical engineers, may result in a reduction in the specified impact allowance which bridges are at present designed to withstand. The impact factor which has to be added to the live load effect on Indian railway bridges is

$\frac{65}{45 + l}$ where l is the length of the span in feet. Thus for spans up to 20 ft., the impact factor is more than the live load.

It is at once obvious that any reduction in the impact factor would result not only in a saving of steelwork in new designs but also existing bridges previously considered too weak, would automatically come into a higher class of strength and heavier engines would be permitted to run on lines where previously they were not allowed. As well as being a great convenience to the operating branch, this might even result in a reduction in the number of engines required. The effect of these experiments on the policy of the Indian railways is, therefore, awaited with keen interest.

(Editorial comment on page 493)

Automatic Signalling on the Berlin Stadtbahn

An article by Reichsbahnsberrat Dobmaier in a recent issue of the *Verkehrstechnische Woche* outlines the progress in automatic signalling on the Stadtbahn since the electrification in 1928. In 1905, power operation of the signals, supplementing the manual lock-and-block system, enabled the headway of trains to be reduced to $2\frac{1}{2}$ min. Previously, the use of progressively shorter block sections had enabled the ten-minute headway obtaining at the opening on February 7, 1882, to be reduced to five and then to three minutes. Automatic signalling was adopted on the Stadtbahn after its satisfactory introduction on

the State electric line from Potsdam to Lichterfelde in 1926, and further reduced the headway to one minute. As the traction system is d.c. with running rail return, a.c. track circuits with impedance bonds were necessary. After experience with the original equipment on the cross-city section, the system was extended at first to the connecting lines and subsequently to most of the North ring, the opened portion of the north-south lines and the branches to Spandau, Wannsee, Gartenfeld, and Lichterfelde. Seventy-one route miles are now so equipped; the remaining 80 are scheduled to be completed by the end of 1939.

VACUUM BRAKE DEMONSTRATION PLANT

A comprehensive installation available for inspection in London

A VERY complete and comprehensive plant for demonstrating the construction and working of the vacuum brake has been installed at Thames House, London, S.W.1, jointly by the Vacuum Brake Co. Ltd. and Gresham & Craven Limited. The installation, illustrations of which we reproduce, supplements the 100-wagon test rack in the Gresham & Craven works, Manchester, and the purpose of the two companies in thus duplicating the apparatus was that of affording facilities to engineers resident in the south to study the vacuum brake and other products by the aid of a full working display which in the

Northey-Boyce rotary exhausters, this being the type adopted by the firms for railway service—either an 8 VAL (200 cu. ft. per min. capacity) or a 6 VAL (50 cu. ft. per min. capacity) can be used at will. The former is the machine which will be used on the L.N.E.R. Manchester—Sheffield electric stock, and the smaller 6 VAL is the size used on railcars and for small brake testing plants. Apart from these working sets, a full range of Northey-Boyce exhausters is exhibited so that the construction and operation can be conveniently examined, and in addition the Northey-Boyce Company has taken advantage of the in-



General view of cylinder rack

past has been available only in Manchester. It is also hoped that advantage will be taken by consulting engineers in London and engineers from abroad who may not find it convenient to travel to the North of England to inspect the plant, and in addition by members of the southern area railwaymen's improvement classes to whom it should be of great instructional value.

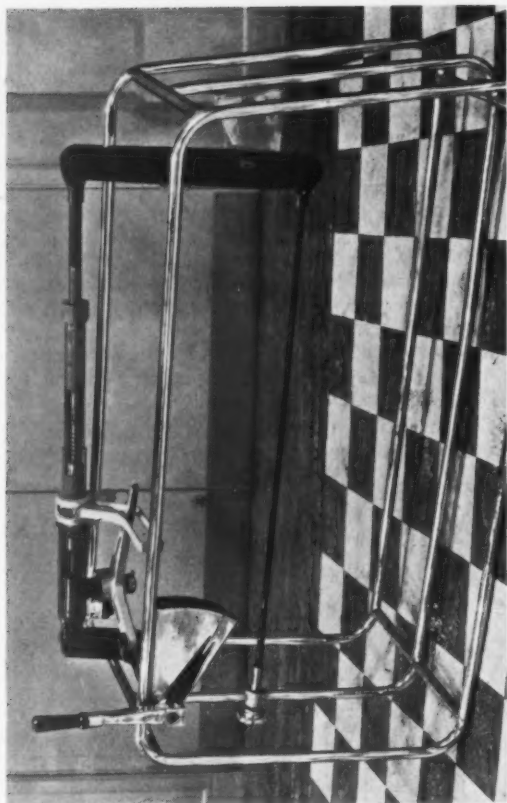
The main feature of the installation is the demonstration brake rack, comprising 50 18-in. cylinders in 1,500 ft. of train piping, which is equivalent in length to a goods train of 50 average four-wheel wagons. It is fitted with suitably located cut-out cocks so that various train lengths can be used, and vacuum gauges from different points are grouped on the central operating table. In this way the development of brake power at any instant and at different points on the train can be readily observed.

Vacuum for the stand is supplied by motor driven

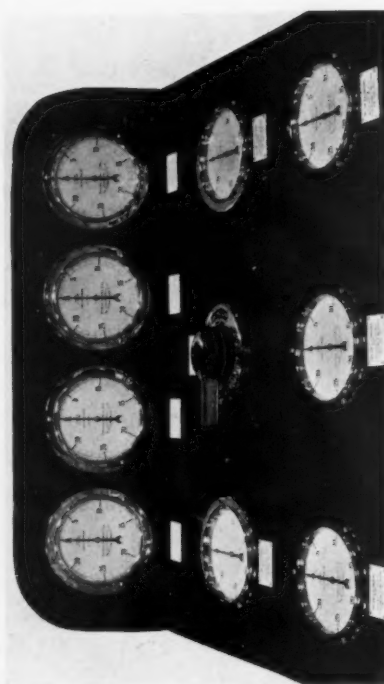
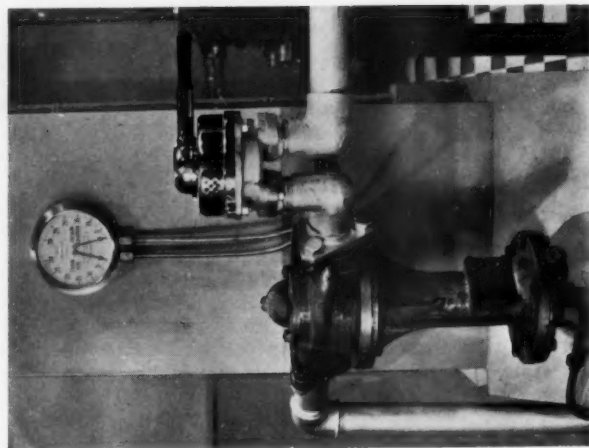
stallation to include a full display of all its commercial exhausters and compressors.

As will be seen from the illustrations the rack is also equipped with the company's latest type of direct admission valve. These have been specially arranged with change-over cocks so that the brake can be operated with the valve cut in or out at will, thus providing a ready means of comparison of the two equipments.

One of the graphs shows the result of tests made in this way on 30 cylinders, representing a 15-coach passenger train, and illustrates clearly the improvement in propagation of emergency applications made possible by the use of these valves. The second graph, showing a slow full service application with DA valves fitted on the same length of train, demonstrates that the improved emergency is obtained without detriment to the complete flexibility which is characteristic of the standard vacuum brake.



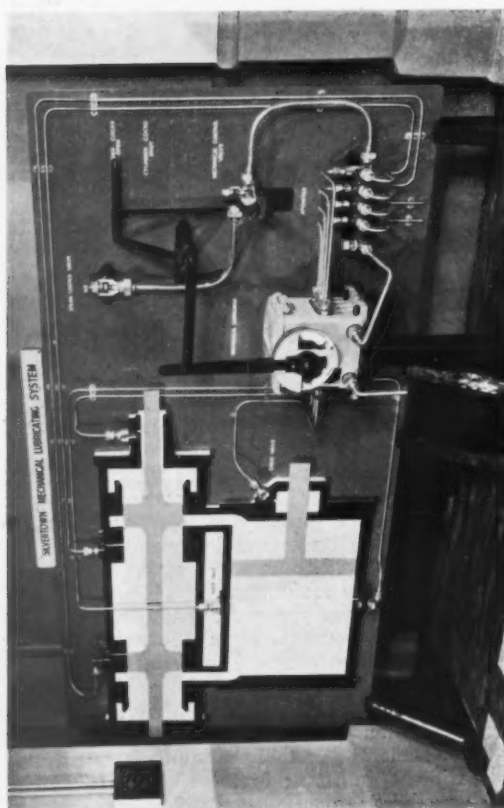
GD automatic slack adjuster



Above : Grouped instrument control panel

Left : View showing cylinders and DA valves

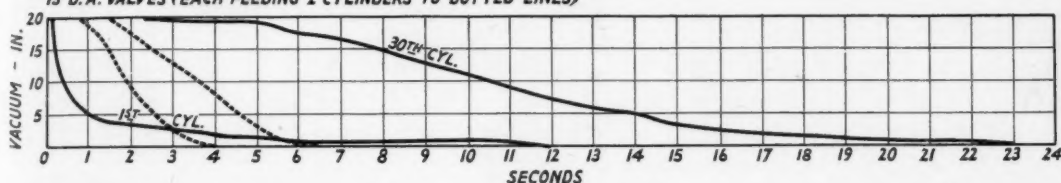
Right : High-speed train control valve



Silvertown mechanical lubrication

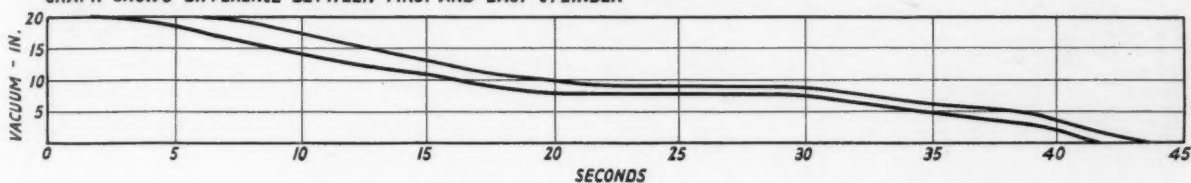


EMERGENCY APPLICATION STANDARD VACUUM BRAKE
30-18" CYLINDERS, 960 FEET, 2" PIPE (FULL LINES)
EMERGENCY APPLICATION
15 D.A. VALVES (EACH FEEDING 2 CYLINDERS TO DOTTED LINES)



Graph showing difference in time of emergency application with and without DA valves

SERVICE APPLICATION SPREAD OVER 45 SECONDS
30 BRAKE CYLINDERS, 960 FEET, 2" PIPE, 15 D.A. VALVES (EACH FEEDING 2 CYLINDERS)
GRAPH SHOWS DIFFERENCE BETWEEN FIRST AND LAST CYLINDER



Graph showing slow full service application with DA valves

Other modern developments in brake equipment shown are the GD automatic slack adjuster and the Gresham high-speed train control valve. The slack adjuster is an actual production article suitably mounted on a stand and part sectioned so that its operation is evident.

The high-speed train control valve is designed progressively to reduce initial high-speed brake power on the train in proportion to the reduction in speed during a stop. It is fitted to the locomotive and controlled by a small axle-driven compressor. In the Thames House plant it is coupled into the main demonstration rack and so arranged that its working conditions can be faithfully reproduced.

One very nicely staged exhibit is the Silvertown mechanical lubricator as standardised by the L.M.S.R. and manufactured by Gresham & Craven Limited. As will be seen from the illustration, a sectioned working model, which again is an actual production article, is mounted on a

board showing diagrammatically the parts of the locomotive to which the lubrication system is applied. All accessories are included, and the system can be operated by hand so that the special form of drive can be clearly seen.

The display is completed by a comprehensive selection of sectional models of the firm's other products such as injectors, ejectors, steam brake valves, and so on, among which is Gresham & Craven's latest SJ type combination ejector. Altogether a most interesting and instructive display has been staged, one that is well worth a visit from anyone connected with railway practice.

We understand that many railway improvement classes have already taken advantage of the facilities offered, and the secretaries of classes who have not already done so are advised to communicate with the Vacuum Brake Co. Ltd. with a view to arranging a special demonstration for their members.

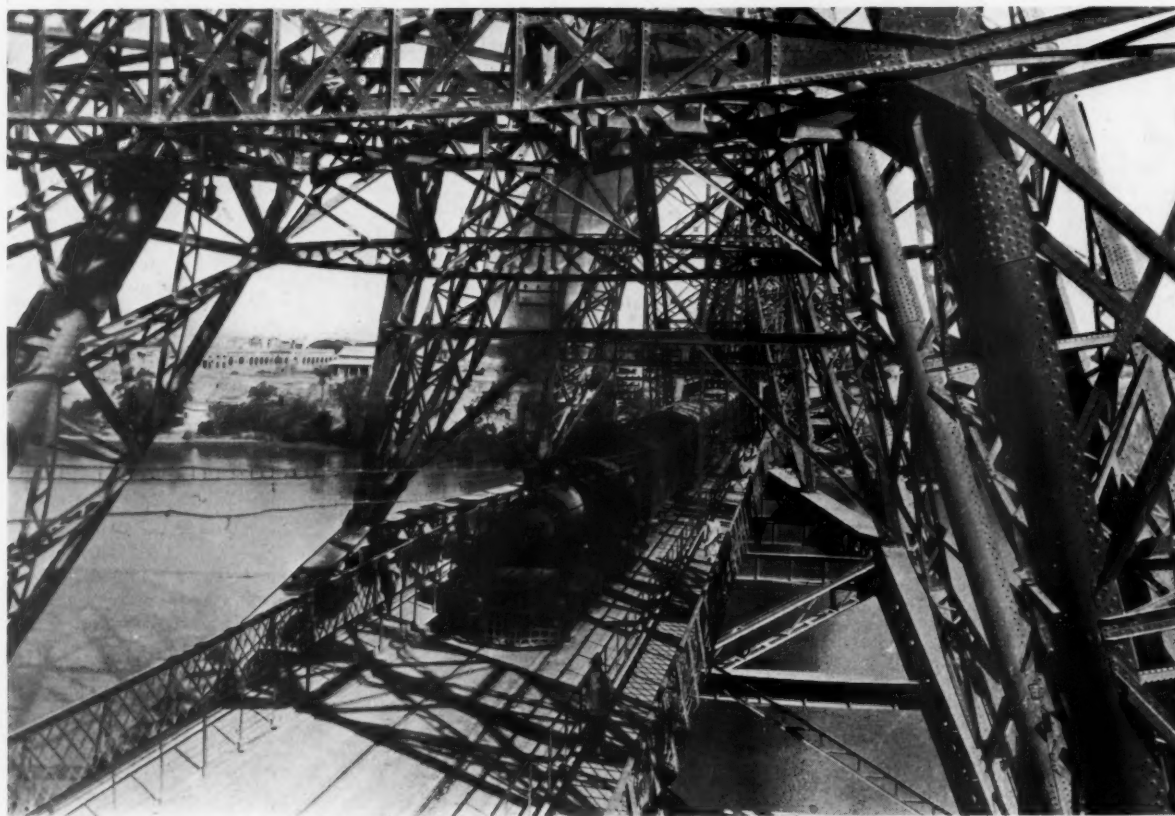


The L.M.S.R. Diesel Train
at St. Pancras

The three-coach L.M.S.R. diesel unit about to leave St. Pancras on its inaugural day of main-line service last Monday. The train maintains a daily schedule between London, Bedford, Luton, Leicester, and Nottingham, as shown in the news article on page 521



General view of the bridge. The length of each cantilever is 310 ft. and that of the suspended span 200 ft., giving a total span of 820 ft.



A Quetta-Lahore passenger train crossing the bridge
THE LANSDOWNE BRIDGE OVER THE INDUS, N.W.R., INDIA
(See article opposite)

JUBILEE OF THE LANSDOWNE BRIDGE

This famous cantilever structure, which, until the opening of the Forth Bridge, had by far the longest rigid span in the world, was opened just 50 years ago

IT was on March 25, 1889, that Lord Reay, the Governor of Bombay, declared open the Lansdowne bridge over the Rohri channel of the Indus at Sukkur. Its 820-ft. cantilever span was then the longest rigid span in the world; the next in length was the 548-ft. span of the Poughkeepsie bridge in America. This distinction was, however, held by the great Indian bridge only until the opening of the Forth Bridge on March 4, 1890.

The Lansdowne bridge was built as the closing link in the chain of railway communication between the Punjab and the port of Karachi. It replaced a steam ferry which, taking eight wagons over at a time, was put into service in 1879 to complete the connection by rail between the Indus Valley State Railway—which ran from Karachi up the right bank of the river—and the Scinde, Punjab & Delhi Railway, whose metals stretched southwards down the left bank of the Indus from Multan.

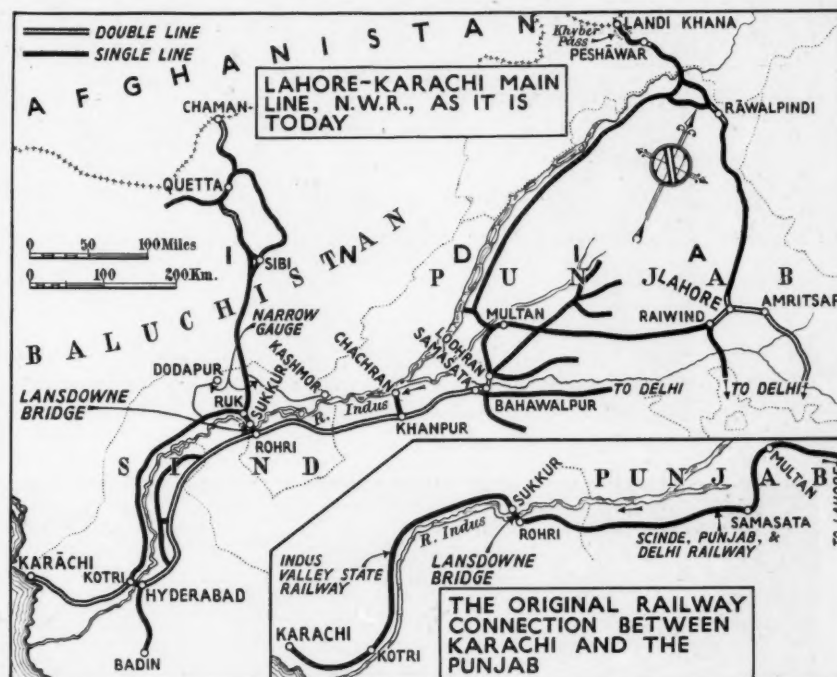
The bedrock of the Rohri channel, chosen for the crossing, shelves gradually out from each shore, but in the middle of the stream there is a deep chasm filled with river silt. This feature would have made the building of piers in the river a difficult task, and so designs were sought to span the channel in one stride. Three designs were put forward, for a stiffened suspension bridge, a three-hinged arch, and a cantilever bridge. The design by Sir Alexander Rendel for a bridge on the cantilever principle was chosen, and contract for the supply of the necessary 3,000 tons of steelwork was let to Westwood & Baillie Limited, of Poplar, London. The girderwork was erected in the makers' yard, and the giant derrick-like cantilevers, towering 170 ft. into the air, became quite a familiar landmark in the East End, before they were dismantled and shipped to India.

Construction Described

The steelwork began to arrive at site at the beginning of 1887, but, beyond fixing the anchors and erecting the staging (200 ft. high) for the main pillar and guy on the Sukkur bank, little was done until the bedplates for the Sukkur cantilever arrived at the end of May. The full supply of steelwork for this cantilever was not received till September, 1887. In November, the bedplates for the Rohri cantilever arrived, and erection then began in earnest. As the pillar and guy on each bank could not stand of themselves till joined, they were built on a timber staging. The large strut was next built in sections, tied back to the pillar by wire ropes. A suspension bridge was then thrown across from the head of the pillar to

the head of the strut, and on this the high-up horizontal tie was built. An aerial ropeway of chains, slung across the channel from the tops of the cantilever structures, was used to erect the noses of the cantilevers. The side plates of the inclined ties—80 ft. long and weighing 15 tons—were the heaviest pieces raised on this ropeway.

The central suspended girder span was erected on a

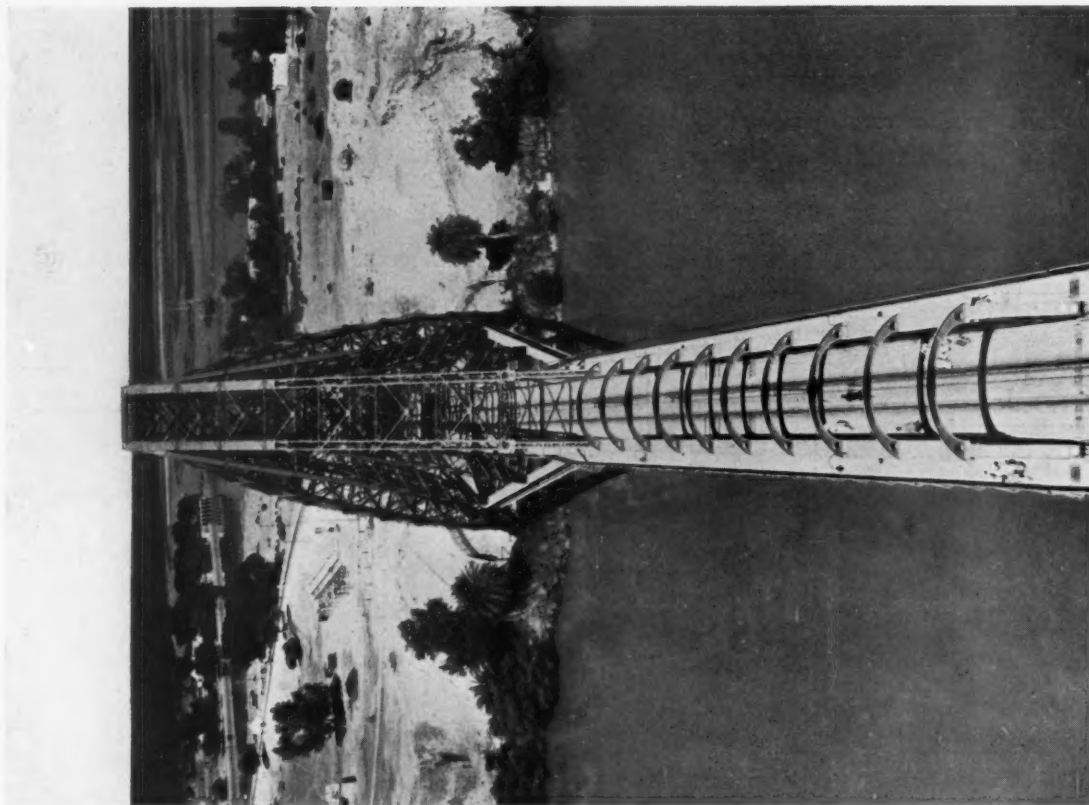


Sketch maps showing (lower) how the Lansdowne bridge linked the early I.V.S. and S.P. & D. Railways, and (upper) its present-day importance

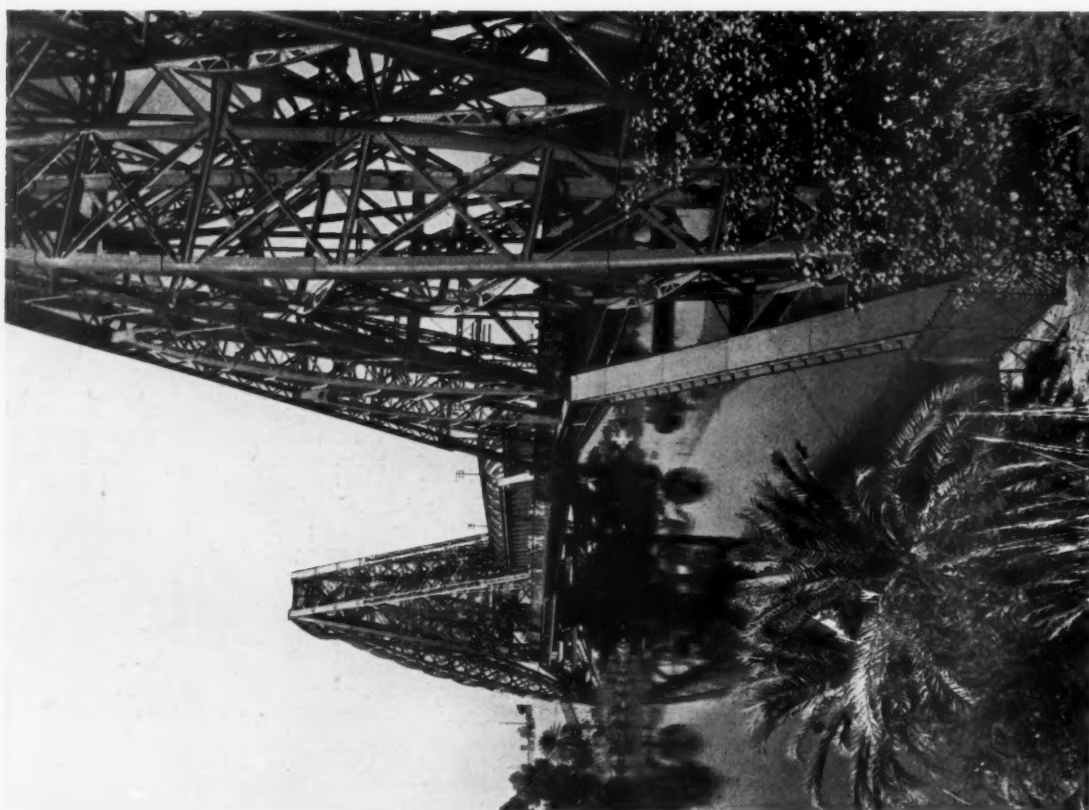
staging hung from the noses of the cantilevers. This staging consisted of a bottom chord of links which was first drawn across and raised to form a suspension bridge. The top chord, with the posts hanging from it, was taken out in pieces by the ropeway used for erecting the cantilevers, and rested on the bottom chord until all the pieces had been placed, when it became a rigid span upon which the girders of the permanent suspended span were erected. This staging was begun on January 18, 1889, and finished on January 30. The erection of the permanent central span was begun on February 5 and completed four days later, a remarkable accomplishment.

Cost, Testing, and Naming

The completion of the bridge, in spite of the difficult places in which the men had to work, was accomplished without accident, except to four men who fell at different times and were killed, and two who were killed by tools falling from a height. The total cost of this bridge was Rs. 26,96,000, equivalent at that time to, probably about £236,000. The bridge was tested on March 19, 1889, the



View along the bridge from the top of the Rohri cantilever



View of the bridge from the Rohri bank of the Indus



Left: The bridge under construction. Note the aerial ropeway slung across the channel from the tops of the cantilever structures, for erecting the noses of the cantilevers

test load consisting of two tender locomotives, chimney to chimney, each weighing 73 tons and occupying a length of 44 ft. 6 in., giving a weight per foot run of 1.64 tons. On each side of the two engines were 16 covered goods wagons. The gross load of the train was 786 tons. Under this load, run across the bridge at 35 m.p.h., a maximum deflection of $3\frac{1}{2}$ in. was recorded at the centre of the span.

At the formal opening ceremony, Lord Reay explained in his address that the Viceroy, while regretting his inability to be present, had given his permission for the bridge to be called after him the Lansdowne bridge.

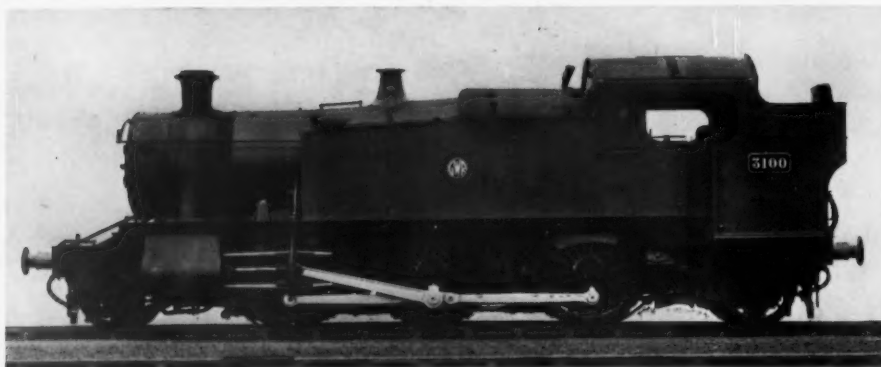
Future of the Bridge

In addition to a single line of broad-gauge railway, the bridge carries a roadway on the same deck—the traffic is worked level-crossing fashion—and two footways for pedestrians. At the time of the opening, the test engines

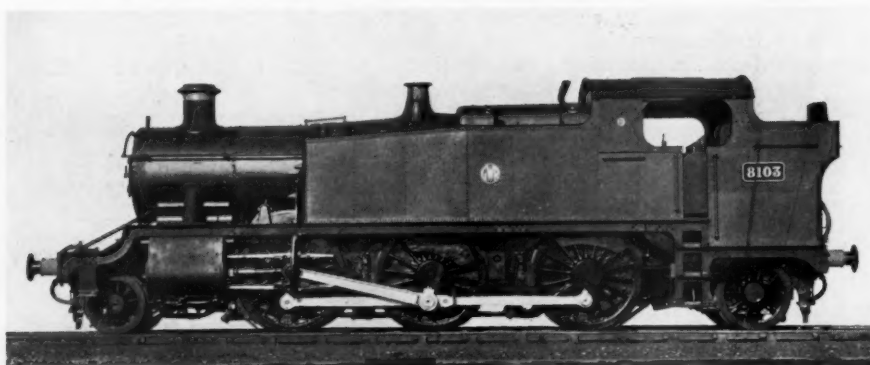
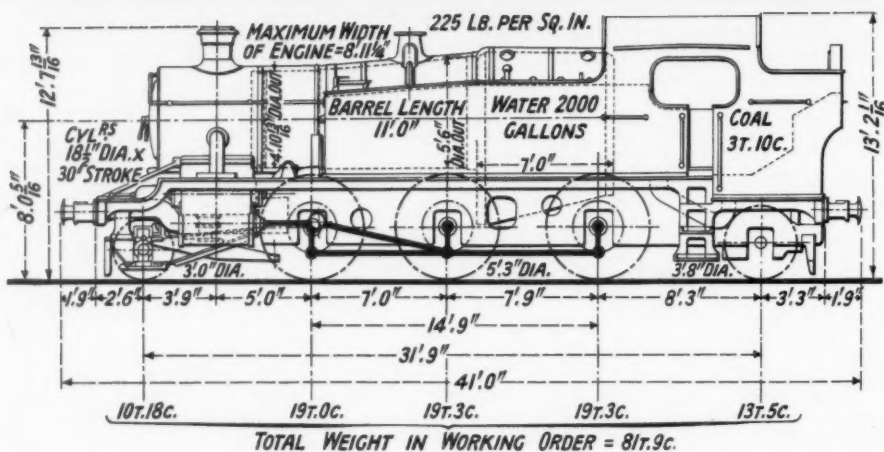
were the heaviest using the bridge and the rolling stock was correspondingly light compared with modern trains. In 1910, the floor was strengthened, and this enabled heavier engines to be worked across the bridge light; but, for many years a severe speed restriction has had to be enforced, and there has been a limit to the weight of engines permitted to work trains across the bridge. This has been a great handicap to traffic, and to improve matters the structure is about to be lightened by the removal of the roadway decking. The road traffic will be diverted to the Lloyd Barrage which is a mile or two downstream. The reduction in the deadweight of the structure will be in the neighbourhood of 180 tons and, as a result, heavier locomotives will be able to work trains across the bridge, a great convenience to the Traffic Department of the N.W.R., as it will then be possible for trains of 72 wagons to be worked through from the main line at Rohri to Sibi, *en route* for Quetta.



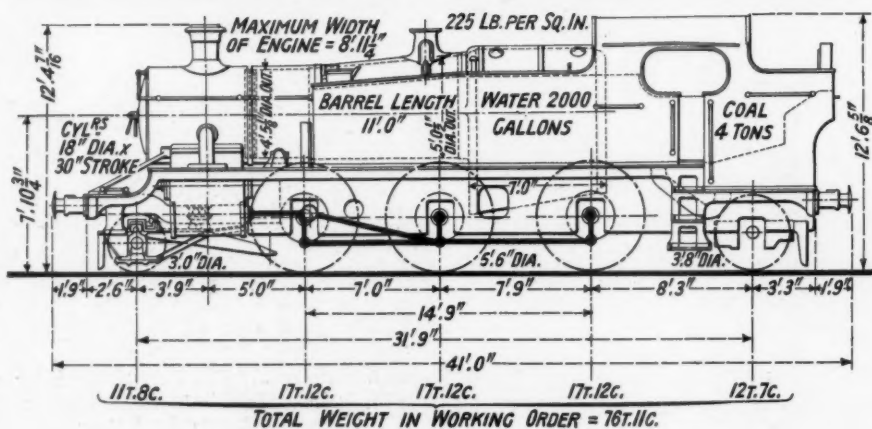
Left: Another view of the construction work showing the Rohri cantilever being erected in October, 1888. Right: The opening ceremony on March 25, 1889. Mr. F. E. Robertson, the Resident Engineer, is seen handing the ornamental key to Lord Reay



Left : The " 3100 " class, with 5 ft. 3 in. wheels and maximum axle load of 19 tons 3 cwt.



Right: The "8100" class, with 5 ft. 6 in. wheels and 17 tons 12 cwt. maximum axle load



**NEW SERIES 2-6-2 TANK
LOCOMOTIVES, G.W.R.**

(See article on opposite page)

NEW SERIES TANK LOCOMOTIVES, G.W.R.

*Reconstruction of two 2-6-2 classes**(See illustrations on opposite page)*

A SCHEME for reconstructing a total of 91 tank engines of the 2-6-2 type is at present being carried out at the Swindon works of the Great Western Railway. These comprise forty-one of the "3150" class, which will in future bear the numbers 3100 to 3140, and fifty engines of the "5100" class, which will begin a new series numbered 8100 to 8149. The first of the new "3100" class and four of the "8100" class engines have already been put into service, and by the courtesy of Mr. C. B. Collett, O.B.E., Chief Mechanical Engineer, G.W.R., we are enabled to reproduce photographs and outline dimensioned drawings of one engine of each series. These locomotives carry the high boiler pressure of 225 lb. per sq. in., thus adding to their tractive effort and general efficiency.

The following table shows the principal differences between the new series and the engines as originally constructed. A considerable increase in tractive effort in each case will be noted :—

Class	"3150"	"3100"	"5100"	"8100"
Boiler pressure (lb.)	200	225	200	225
Dia. of coupled wheels	5 ft. 8 in.	5 ft. 3 in.	5 ft. 8 in.	5 ft. 6 in.
Tractive effort	25,670	31,170	24,300	28,165

The locomotives are well adapted for both passenger and goods train working, and will be used to meet the requirements of both classes of traffic. They are of a very useful type, and in addition to the dimensions given on the drawings reproduced on the opposite page they have the following particulars :—

	"3100" class	"8100" class
Cylinders, dia.	18½ in.	18 in.
stroke	30 in.	30 in.
Wheels, coupled, dia.	5 ft. 3 in.	5 ft. 6 in.
pony truck	3 ft. 0 in.	3 ft. 0 in.
radial truck	3 ft. 8 in.	3 ft. 8 in.
Boiler, working pressure	225 lb. per sq. in.	225 lb. per sq. in.
Heating surface, tubes	1,349 sq. ft.	1,145 sq. ft.
firebox	129 "	122 "
Total (evaporative)	1,478 "	1,267 "
Superheater	192 "	82 "
Combined total	1,670 "	1,349 "
Grate area	20.6 "	20.4 "
Tractive effort (at 85 per cent. b.p.)	31,170 lb.	28,165 lb.
Adhesion weight	57 tons 6 cwt.	52 tons 16 cwt.
Weight in working order	81 " 9 "	76 " 11 "
Water capacity	2,000 gal.	2,000 gal.
Coal	3 tons 10 cwt.	4 tons

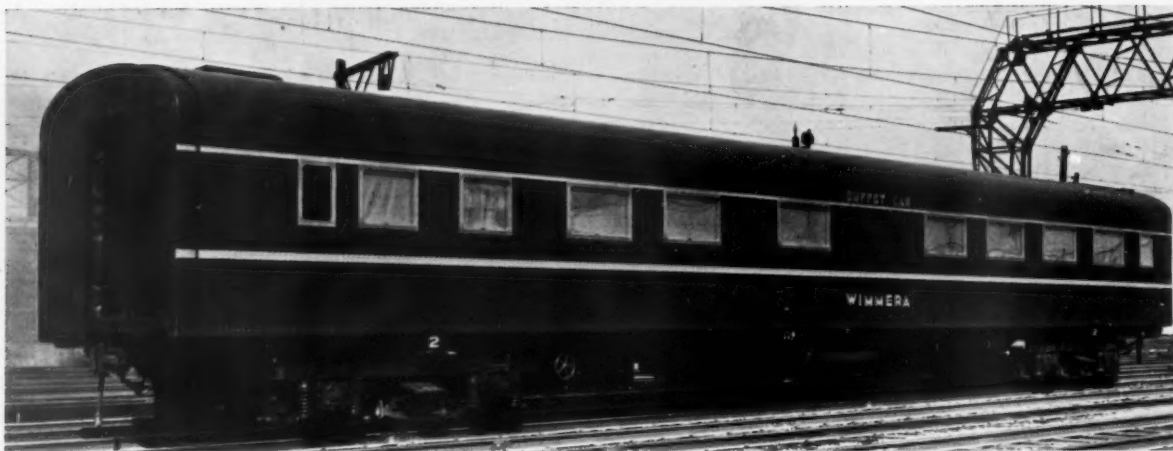


Above : One of the 4-6-0 broad gauge mail engines of the Bombay Baroda & Central India Railway that are now being painted maroon in accordance with the company's colours



Right : Southern Railway "Schools" class engine No. 934 "Westminster" decorated for hauling the train that conveyed the French President, M. Lebrun, and Mme. Lebrun, from Dover to Victoria on March 21

New All-Steel Air-Conditioned Buffet Car, Victorian Railways



*Above : Exterior of "Wimmera,"
75 ft. in length, in its red and
silver livery*



*Right : The 52-ft. buffet saloon
seating 27 passengers*



*Left : The kitchen, 14 ft. 10 in.
in length, and equipped for
heating food with steam supplied
by slow-combustion coke stoves*

RAILWAY NEWS SECTION

PERSONAL

Colonel O. G. Edwards, V.D., A.D.C., J.P., Controller of Stores, Great Indian Peninsula (State) Railway, proceeded on leave preparatory to retirement on March 20. Colonel Edwards began his railway career when he was articled to Mr. J. W. Jacomb-Hood, Chief Engineer of the former London & South Western Railway, and worked under his father, Mr. O. A. G. Edwards, M.Inst.C.E.,



Colonel O. G. Edwards

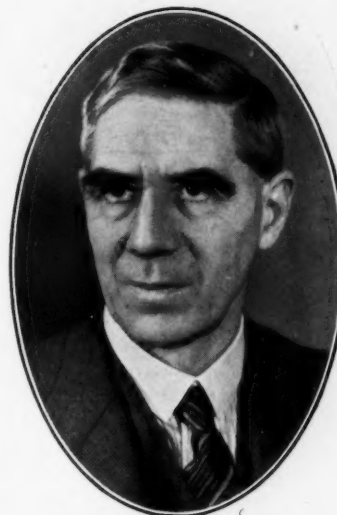
Controller of Stores, G.I.P.R.,
1932-39

Divisional Engineer at Clapham Junction, Eastleigh, and Exeter, at the same time as Mr. Gilbert Szlumper, the present General Manager of the Southern Railway. Mr. Szlumper's father was at one time Resident Engineer at Akola, a district which subsequently came under Colonel Edwards's jurisdiction while he was serving in the Engineering Department of the G.I.P.R. On his first appointment to the Indian railway service in 1905, as an Assistant Engineer, Colonel Edwards was posted to Poona, thereafter rising to the rank of First Class Resident Engineer in 1914. During the war, Colonel Edwards saw service in Mesopotamia, and on his return to railway duty in India, he rejoined the Engineering Department of the G.I.P.R., in which he rose to the rank of District Engineer in 1924. In 1931 he became Deputy Chief Engineer (Maintenance), and in May, 1932, was appointed Controller of Stores in charge of the Stores Department of the same railway. While in command of the 1st Battalion of the G.I.P.R. Regiment, Indian Army Auxiliary Force, he was

appointed Hon. A.D.C. to H.E. The Commander-in-Chief in India, and later on, while Commandant of the regiment, he was appointed Hon. A.D.C. to H.E. The Viceroy. Outside his official activities, Colonel Edwards took the keenest interest both in cricket and in yachting. He not only played for the Bombay Presidency, but in his younger days played also in county cricket. During many years in Bombay he acted as Starter of the Royal Bombay Yacht Club, of which he was a member of the committee. In 1936, he visited England as one of the officers selected by the Government to represent the Indian armed forces at the Coronation of King George VI, and was in camp with the Indian Contingent at Hampton Court.

Mr. H. Holcroft, who has been appointed Technical Assistant (Locomotives), C.M.E. Office, Southern Railway, began his career with the Great Western Railway as a premium apprentice in the Stafford Road locomotive works at Wolverhampton, serving for five years. After three years' varied experience in the drawing office there, he was transferred to headquarters at Swindon in 1906 and took part in the design of Mr. G. J. Churchward's standard engines. In 1909 Mr. Holcroft obtained leave of absence and visited engineering works and railway shops in Canada and the U.S.A., in order to gain some insight into American practice. On the completion of the G.W.R. new engine programme in 1910, he was transferred to the general section of the drawing office and obtained experience in hydraulic plant, structural steelwork and building construction, layout of workshops, oil-gas plant, and dock and coal-handling plant. Early in 1914, when Mr. R. E. L. Maunsell became Chief Mechanical Engineer of the S.E. & C.R., Mr. Holcroft joined his staff at Ashford for the purpose of preparing plans for the re-building, extension and reorganisation of the locomotive, carriage, and wagon works, but this work eventually came to a stop after the outbreak of war and the scheme was abandoned when the grouping of the railways came about. He was then called in to assist in the ordering of railway material from War Office indents and to inspect the supplies passing through Ashford works for the railways in France, Belgium, and elsewhere. Later he was placed in charge of the R.E.C. Military Railway Depot at Purfleet, Essex. After the war, Mr. Holcroft entered the locomotive drawing office at Ashford for a short period in order to produce schemes for the three-cylinder engines which were subsequently built by Mr. Maunsell. The next few years were spent in experi-

mental work on engines in service, during which time he acquired experience of footplate work. When Mr. Maunsell moved his headquarters to Waterloo after the grouping in 1924, Mr. Holcroft was one of those selected for the staff, and he was subsequently appointed an Assistant to the Chief Mechanical Engineer, his duties being mainly concerned with the outdoor activities of the department. While at Swindon, Mr. Holcroft was Secretary of the G.W.R. Engineering Society for



Mr. H. Holcroft

Appointed Technical Assistant (Locomotives),
C.M.E. Office, Southern Railway

three years, and from 1918 to 1931 was Honorary Editor of the *Journal of the Institution of Locomotive Engineers*, since when he has been a Member of Council of that institution. He has served on the Committee of the Southern Railway Lecture and Debating Society since its foundation, and for the last three sessions has acted as Chairman.

Mr. W. A. Graham will retire on April 1 from the position of Mechanical Engineer, Docks & Marine Department, Southern Railway. Mr. Graham served his apprenticeship in the Marine Workshops, Newhaven, and the locomotive works, Brighton, of the former London Brighton & South Coast Railway. He performed sea service on the L.B.S.C.R. cross-Channel steamers, in the various capacities from Junior to Chief Engineer, with appointment to the latter post in 1903. Meanwhile, in 1900, he had obtained his Extra-First Class Board of Trade Certificate as Marine Engineer. Mr. Graham was appointed Assistant Marine Superintendent Engineer of the L.B.S.C.R. in

1912. During the Great War he was Senior Engineer Officer on the Naval Staff at Newhaven, with rank of Engineer Commander (R.N.R.), which rank he still holds. He was awarded the O.B.E. (Military) in recognition of services rendered in connection with H.M. naval transports, torpedo boats, M.L.'s, trawlers and drifters, salvage, &c., and received letters of thanks from the Admiralty, Ministry of Shipping, and Ministry of Transport for services rendered. Mr. Graham was appointed Assistant Mechanical Engineer, Southern Railway, Southampton Docks, on January 1, 1924. On July 1, 1930,

propellers applied to the new passenger and motorcar ferry *Lymington* operating between Lymington and Yarmouth, I. of W. Mr. Graham is a Member of the Institute of Naval Architects, and of the Institution of Mechanical Engineers (also a Member of the committee of the Southern Branch of that institution). He is also a Vice-President of the Institute of Marine Engineers, a Fellow of the Royal Society of Arts, a Vice-President of the University College Engineering Society, Southampton, and a Member of the South Coast Engineering & Shipbuilders' Association, Southampton.

who is Vice-President and General Manager of the Eastern Lines, Canadian Pacific Railway, succeeds Mr. J. H. Walsh, who died recently.

We regret to record the death on March 19 at the age of 62 of Mr. G. O. Humphreys, who retired three years ago, on account of ill-health, from the position of District Goods Manager, Bolton, L.M.S.R. Mr. Humphreys joined the L.N.W.R. in 1892 as a Superior Apprentice. He worked for a time in various capacities at dock stations in Birkenhead and Liverpool, and served also at district headquarters



Mr. W. A. Graham

Mechanical Engineer, Docks & Marine Department, Southern Railway, 1930-9



The late Khan Bahadur A. A. Khan

Sometime Agent, Mysore Railways, and Secretary to the Government of Mysore for Railways



The late Mr. G. O. Humphreys

District Goods Manager, Bolton, L.M.S.R., 1928-36

he was promoted to Superintendent Mechanical Engineer, Southampton Docks, Southern Railway, becoming responsible for the engineering personnel of all the company's vessels operating from Southampton; all locomotive, steam and hydraulic crane personnel; all staff employed in the company's workshops at Southampton on the up-keep and repair of the docks plant and machinery and the whole of the fleets at Southampton, Portsmouth, Lymington, Newhaven and Dover; the present-day number of the staffs thus controlled is just over 1,000. Mr. Graham has been responsible also for the construction of all new vessels for the Southampton, Portsmouth and Lymington services, some of which have embodied features new to railway-owned vessel practice. Examples have been the combination of Scotch and water-tube boilers in the cross-Channel steamer *Isle of Sark*, effecting considerable economy in fuel consumption, and the adoption in the same vessel of the Denny-Brown ship stabilisers, which device has since been adopted in several Admiralty vessels. Triple-expansion engines have been fitted in the paddle steamers *Sandown* and *Ryde* on the Portsmouth-Isle of Wight services, and Voith-Schneider

We regret to note the death, on January 20, of Khan Bahadur Abdul Aziz Khan, M.Inst.T., who for many years was first Traffic Manager, and later Agent of the Mysore State Railways, and Secretary for Railways to the Government of Mysore. The Khan Bahadur gained his early experience on the Indian State Railways in the Traffic Department, and rose to be District Traffic Superintendent, before his selection as officiating Traffic Manager of the Mysore Railways. In 1926 he was appointed to officiate as Agent of that system, and a year later the Government of India sanctioned his confirmation in that appointment at the request of the Mysore Durbar, though he was then only 36 years of age. After 12 years' service in Mysore the Khan Bahadur reverted to the Indian State Railways service, and until his untimely death was Superintendent of Claims, East Indian Railway. He was a Member of the Institute of Transport.

The appointment of Mr. H. J. Humphrey, of Toronto, as Vice-President and Director of the Quebec Central Railway Company was officially announced at Sherbrooke, Quebec, on March 11. Mr. Humphrey,

and as Head of the Transit Section and Chief Claims Clerk. In addition, special duties took him to Greenore, Chester, and later to the Outdoor Goods Manager's Office, Northern Division, Manchester. In 1911 he was appointed Outdoor Assistant to the District Traffic Superintendent at Swansea, and in 1915 he went to Wolverhampton as Assistant District Goods Manager. He was then attached to the Ministry of Munitions as Munition Transport Officer for the Central Division, with headquarters in Birmingham. He was transferred in 1916 to the Coal Controller's Department in London. For his work as Head of the Transport Section of this department he received the M.B.E. In 1919 he was appointed Assistant District Goods Manager at Manchester, and in 1925, under the L.M.S.R., he took up a similar position at Leeds, whence he went in 1928 to Bolton as District Goods Manager, the position in which he remained until his retirement in 1936. The funeral took place at Rake Lane Cemetery, Wallasey, on March 22.

We regret to record the death on Saturday last at the age of 79 of Sir Henry Lunn, founder of the travel organisation which bears his name,

and which has offshoots in Alpine Sports Limited, and the Hellenic Travellers' Club. 'Sir Henry, who was born in 1859, became interested in travel work as a result of his arranging the annual conferences of religious leaders at Grindelwald, which were organised to promote the reunion of the churches. This was a cause dear to Sir Henry's heart; his own religious position was that of a "Methodist member of the Anglican Church." He played a part in many Liberal movements while Asquith was in power, and he was knighted in 1910.

We regret to record the death at Brisbane of Mr. J. W. Davidson, C.M.G., who, as recorded in our issue of May 6 last, retired in 1938 from the position of Commissioner for Railways, Queensland, after 19 years of office.

Mr. J. E. Montgomery, B.Sc.(Eng.), M.I.Mech.E., has been appointed Secretary of the Institution of Mechanical Engineers in succession to Brigadier-General Magnus Mowat, C.B.E., who has retired on account of ill health. Mr. Montgomery has been Assistant Secretary of the institution since 1920.

From *The London Gazette* of March 14: Regular Army, Supplementary Reserve of Officers, Royal Engineers, Transportation: A. E. Hoffman to be Captain (March 15).

To be Lieutenants (March 15):—

J. S. Hamer, Sapper J. A. S. Sheriff (from Supp. Res., R.E.), and E. A. S. Ford.

To be Second Lieutenants (March 15):—

Lance-Corporal J. B. Blake, from Supp. Res., R.E. (late Cadet, Tonbridge School Contingent, O.T.C.), Sapper N. E. Norman, from Supp. Res., R.E. (late Cadet Lance-Corporal, King's College School Contingent, O.T.C.), Sapper H. A. Hammett, from Supp. Res., R.E., and Sapper R. A. Harrison, from Supp. Res., R.E.

INDIAN RAILWAY STAFF CHANGES

Lt.-Colonel H. H. E. Gosset, R.E., has been appointed to officiate as Deputy General Manager, Works, and Secretary, E.B.R., as from January 30.

Mr. H. N. Sahgal has been appointed to officiate as Deputy Chief Engineer, E.B.R., in place of Colonel Gosset as from the same date.

Mr. H. G. Jones, Deputy Chief Mechanical Engineer, E.I.R., has been granted 8½ months' leave as from February 9.

Mr. R. A. Sharpe has been appointed to officiate as Chief Electrical Engineer, M. & S.M.R., vice Mr. A. F. Clay, granted six months' leave as from March 6.

Mr. H. K. Bose has been appointed to officiate as Deputy Chief Accounts Officer, E.I.R., as from January 19.

Mr. H. W. Meakins, Deputy Traffic Manager, E.B.R., has been granted four months' leave as from March 1.

Modern Transport Problems

Address by Dr. Burgin to Royal Empire Society

Dr. Leslie Burgin, P.C., LL.D., M.P., the Minister of Transport, was the chief guest at a luncheon given in London by the Royal Empire Society on March 21, and gave an address on some of the problems with which a Minister of Transport in these days has to contend. Among those present were:—

Colonel C. E. Ponsonby, M.P. (Chairman), Mr. L. B. Pearson (Official Secretary, Canadian Government Office), Major C. H. Dale (Commissioner, East African Dependencies Office), Sir John Shelley-Rolls, Bt., the Hon. Claude James (Agent-General for Tasmania), Major-General the Rt. Hon. Sir Frederick Sykes (Chairman of Council, Royal Empire Society), Mr. Clifford Hay (Agent-General for New South Wales), Mr. Gilbert S. Szlumper (General Manager, Southern Railway), Vice-Admiral Wade Caulfield, Mr. Vaughan Cornish, Mr. W. E. Rootes (President, Society of Motor Manufacturers and Traders), Ralph S. Bond (Deputy Chairman of Council, Royal Empire Society).

Dr. Burgin discussed first the problems created by huge cities, in which every one of some 9,000,000 inhabitants acted as a magnet to the trades and industries catering for their needs. He asked what contribution could be made to the traffic problem of London if one had £25,000,000 to spend, and pointed out that the answer would not necessarily be the construction of new roads here and there. If they were to build a tube railway or electrify a suburban line, almost all the expenditure of public money would contribute employment to numbers of our workmen. If they built a road in a built-up area and paid compensation for buildings pulled down, only five shillings in every twenty would go to employment.

Speaking of schemes for bridges in London, Dr. Burgin said that the suggested outlay of fifteen to twenty millions on the Charing Cross bridge project had been thought not the wisest use of money, and might involve approaches running as far back as Euston Road on one side and a corresponding distance on the other. Bridges brought traffic to roads it had never thought of using before, and so might add enormously to the troubles of districts already overcrowded. He expressed apprehension at the possible effect of the new Waterloo bridge, which would bring six lines of traffic into the Strand. One of the problems he would have to face would be how to "siphon" traffic off the bridge, and what to do with it when it got into the Strand.

Dr. Burgin described Great Britain as the most "railwayed" and the most "roaded" country in the world. We had developed not merely main lines and main roads, but also the cross-connections more highly than anywhere else. On the main line from London to Crewe, express trains travelling at almost frightening speeds left Euston at intervals measured in minutes. Goods trains at night ran at speeds hitherto entirely undreamed of. These matters were being developed in this country on a greater scale than anywhere else in

the world. The train-mileage in relation to the track-mileage on the Southern Railway was easily the highest in the world, over 30,000 train-miles per route-mile being run in a year. Corresponding figures for other British railways and overseas countries quoted by Dr. Burgin were:—

	Train-miles per route-mile per year
L.M.S.R. ...	22,000
G.W.R. and L.N.E.R. ...	17,000
United States ...	17,000
Belgium ...	15,000
Holland ...	15,000
France ...	14,000
Switzerland ...	13,000
Germany ...	13,000

We were working our railway system at a faster tempo than anyone in the new world, with its wide open spaces, had ever dreamed of.

Transport taken as a whole was quite easily the largest industrial group there was, employing well over 2,000,000 people, of which 600,000 were on the main-line railways, 500,000 in transport other than rail, 400,000 in construction and repair of vehicles, and 500,000 in road building and petrol distribution.

The Ministry of Transport was responsible for 20,000 odd miles of main-line railway, 178,000 miles of road, 2,500 miles of canals, and 285 docks and harbours. In time of trouble they had to think of protecting all these services from possible air attack. An immense problem was the fact that in an emergency certain ports might become unusable, and all traffic going to one coast might have to be switched to another, causing ports there to multiply their daily turnover by something like four.

Forthcoming Events

Mar. 28 (Tues.).—Institute of Transport (Birmingham Graduate), at Chamber of Commerce, 6.30 p.m. Annual General Meeting. Institution of Electrical Engineers (North-Western), at Engineers' Club, 17, Albert Square, Manchester, 7.15 p.m. "The Metadyne and its Application to Electric Traction," by Messrs. G. Fletcher and A. Tustin.

L.N.E.R. Musical Society, at Hamilton Hall, Liverpool Street, London, E.C.2, 8 p.m. Concert.

Mansion House Association on Transport, at Trocadero Restaurant, Piccadilly Circus, London, W.1, 12.45 for 1 p.m. Luncheon and Annual General Meeting.

Mar. 29 (Wed.).—Railway Convalescent Homes, at Hotel Great Central, Marylebone Road, London, N.W.1, 6.15 for 6.45 p.m. Spring Dinner.

Mar. 30 (Thurs.).—Institute of Transport (Nottingham Graduate), at Guildhall, 7 p.m. Annual General Meeting.

Railway Club, at Royal Scottish Corporation Hall, Fetter Lane, London, E.C.4, 7.30 p.m. "The Past Forty Years in Retrospect," by Mr. Charles E. Lee.

Southern Railway (London) Lecture and Debating Society, at Chapter House, St. Thomas's Street, S.E.1, 5.45 p.m. Annual General Meeting. "British Railway Capital," by Mr. D. Vine. "The Problem of the Level Crossing," by Mr. J. Turner.

Mar. 31 (Fri.).—Institution of Locomotive Engineers (London), at Trocadero Restaurant, Piccadilly Circus, W.1. Annual Dinner.

Mr. T. W. Royle on Marshalling Yard Modernisation

Lecture to the Railway Students' Association at the
London School of Economics

The fifth ordinary meeting of the Railway Students' Association was held on Monday, March 20, in the new lecture theatre of the London School of Economics, Aldwych, when Mr. T. W. Royle, Chief Operating Manager, L.M.S.R., read a paper on "Modernisation of Marshalling Yards and Shunting Methods on the L.M.S.R." The speaker was introduced by the Chairman, Mr. H. H. Mauldin, Divisional General Manager (Southern Area), L.N.E.R.

Mr. Royle said that the real object was to give an insight into present day methods employed on the L.M.S.R. in connection with the rationalisation of freight shunting; he proposed to deal with the question purely from the operating aspect, which would, however, embrace to some extent the cost of performing shunting. Unlike locomotives, high-speed trains, and modern passenger stations, extremely little publicity was given to shunting. In contrast with the speed fiends who travelled in the well-known passenger expresses with their eyes glued on the quarter mile posts or their ears on rail joints, obtaining the miles per hour to several places of decimals, no one was ever seen recording feet per second in a marshalling yard, and it was his sincere wish to try to interest them in a subject which was generally regarded as unspectacular, but was one which should receive much more earnest attention in the future.

The primary reason that they on the L.M.S.R. were taking such a keen interest in shunting was on account of the heavy cost, but they were also out to create greater efficiency. On the question of cost, it might not be generally recognised that there were no published statistics in this country, which placed a cash value on shunting, although they were fairly well equipped with statistics of engine shunting-hours. There were, as a matter of fact, considerable difficulties in the way of representing accurately the cost of engine shunting power, and he did not propose to go into lengthy explanations. Nevertheless, shunting did cost money, as they on the L.M.S.R. were forcibly reminded several years ago by the company's Chairman, Lord Stamp, who stated that shunting wagons was costing the L.M.S.R. over £5,000,000 a year.

Measuring Shunting Costs

It should also be borne in mind that in addition to the cost of providing engines and shunting staff, they had to consider the interest on the land required, construction of marshalling yards, maintenance of permanent way and signalling, lighting, telephones, local rates and other expenditure required at marshalling and other yards

and stations where shunting was performed, including work done by guards. So far as the ground staff was concerned a study of the railway companies' annual accounts would show that the annual wages of the shunting staff, including inspectors, foremen, shunters, and pointsmen, amounted, with other expenses on poles, &c., in 1938, to £3,500,000 for the four companies, but that of course excluded the many other factors he had mentioned. They appreciated, no doubt, that on all railways shunting returns of various kinds were and always had been prepared concerning the more important yards, usually giving the hours and wagons dealt with, and that either by this or other means domestic to the particular railway company shunting performance was watched currently and adjustments made in staff and motive power as necessary.

Referring again to rationalisation, Mr. Royle mentioned an instructive paper presented to the Institute of Transport Congress at Buxton on June 1, 1932, entitled "Rationalisation of the L.M.S.R.—Principles of Management and Control," in which Mr. E. J. H. Lemon, their Vice-President (Operating and Commercial), gave, among other illustrations as to how rationalisation was being applied to various phases of railway work, the example of comparative analysis. This had been defined as "the process of comparing similar operations carried out on different parts of the line—whether, say, of shunting, the manufacture of parts of locomotives, or any other process, in order that the similarities and differences may be looked at with a seeing eye, and with 'why' constantly on the lips of those people who are investigating."

On the L.M.S.R., part of the process of rationalisation was known as "job analysis," which involved taking such records of individual jobs and their component parts that one could analyse everything down to the "Nth" degree, with the object of reducing the cost of, say, producing a given article as in a modern factory. It was difficult to introduce "precision recording" on a widespread scale at shunting yards scattered all over an extensive railway system in view of wide fluctuations in traffic, and adverse weather conditions, which caused trains to run late and disturbed the normal continuity of shunting work. However, the L.M.S.R. had tackled the shunting yard from the point of view of "job analysis," and as a result had effected considerable economies in shunting costs. A small section of staff was appointed at each divisional operating headquarters, and was responsible to the appropriate assistant of the divisional superintendent.

Special recording sheets and analysis forms were printed, and at the discretion of the divisional superintendent this "shunting analysis committee" descended upon a particular yard and took a complete 24-hr. record of all movements, staff and motive power, wagons dealt with, and so on, sectionalised under the headings of working time, standing time, shunting by train engines and regular shunting engines respectively, and numerous other sub-headings, in consecutive hourly periods. The results were then studied by the responsible officer, and in consultation with the local officer adjustments to engine power and staff were decided upon as necessary. Other records were taken, such as analysing the flow of traffic through a yard, to see whether any of it could or should be diverted, and whether altered train-classification and/or adjusted timings would be an advantage, either in assisting to reduce costs or to expedite the transit of traffic.

Obstacles to Modernisation

When shunting analyses were studied in detail, it was sometimes found that a high proportion of standing time to shunting time at a marshalling yard, whether of locomotives or ground staff, indicated that the layout and/or the yard equipment fell short of the ideal. It had to be borne in mind that with a few exceptions the shunting yards on the L.M.S.R. represented a legacy from the individual constituent and subsidiary companies as they existed before the railways were grouped in 1923, and embodied the designs of different individuals in very many instances. In some cases they were cramped because of physical limitations, and in others they were a compromise between available physical space and limited expenditure. Unfortunately many yards had been enlarged merely by tacking on a few sidings, &c., with the result that the design from the point of view of efficient operation was completely distorted, when viewed from modern standpoints. How to re-design the inefficient yards, modernise their shunting equipment and improve their shunting technique in order to reduce shunting costs was the problem confronting them today. It was, of course, essential that a yard should be in a suitable location from a geographical standpoint, but they found in many instances that, owing to the existence of roads, industrial developments, and built-up areas, it was impossible to acquire sufficient land, except at unthinkable cost. They were, therefore, compelled to do the best possible in the particular circumstances, and whilst large scale progress in a matter of that kind could not take place at a rapid pace owing to the financial and other considerations involved, there was much in hand in various stages of development and many features of interest worthy of close attention.

Shunting Engine Crews

It was generally agreed that, if some kind of motive power could be de-

signed to avoid the need for two men on an engine solely employed in a shunting yard and not requiring to proceed on to a main line, there was not the same justification for employing two men on the footplate as in the case of, say, a main line train. To the London & North Eastern Company credit was due for being the pioneers in introducing an appreciable number of one-man shunting engines. These were mostly of the Sentinel type of steam locomotive with capacities of about 100 and 200 h.p., which in their own experience was not sufficient for all-round shunting requirements. The L.M.S.R., however, developed a one-man shunting engine of greater capacity and had introduced a heavy duty shunting locomotive worked by diesel engines with electric transmission. They had some 21 of these units in service at the present time and a further 20 on order, and, owing to high initial cost, their use at present was confined to yards with 24 hr. continuous duty. They were capable of performing all normal shunting requirements whether at flat yards or those with humps. Their performance was promising, and they possessed certain operating advantages over steam shunting locomotives.

Substitutes for the Locomotive

In older good yards where space was limited, shunting tractors capable of hauling or propelling 5 or 6 loaded coal wagons or the equivalent in tonnage, could perform the movement and positioning of wagons, provided the permanent way was made up to rail level at essential points. For such light duties it was much more economical to move wagons by this means than by utilising locomotives with a capacity greater than necessary, and in some instances where teams of horses had in the past been employed on this work it was found cheaper to employ tractors. Another advantage of these tractors was their rapid movement from one part of a yard to another without having to keep to the rails. There was a number of these tractors at work on the L.M.S.R. They required only one man to operate them, with an attendant to look after the coupling and turn points, apply hand brakes on the wagons, and similar duties, and worked on petrol, although consideration was being given to the development of a suitable power unit consuming diesel or other fuel oil. The introduction of these machines was limited to places where the sidings consisted of short spurs, and where fairly constant attendance was required for moving small numbers of wagons.

Capstans were extensively employed at goods and dock depots where the rafts of wagons to be moved were not unduly heavy and in all new and remodelled goods depots modern types of capstan were installed. Horses were sometimes used for moving odd wagons at exceptional places, but these were very few and were gradually being re-

placed by mechanical means. Pinch bars, or a type of crow bar, were used at certain wayside places where it was only a question of positioning an odd wagon or two and experiments had recently been conducted to determine the most satisfactory of various types on the market. They had considered a form of power unit running in a pit for hump shunting, but, apart from the heavy cost, it was essential to have a mobile unit at all hump yards for miscellaneous work in the sorting sidings, such as closing wagons together, correcting wrong shunts, and drawing back for subsidiary sorting. They had recently been considering the possibility of giving the driver of an ordinary steam shunting engine better visibility during shunting operations, and duplicating the regulator and other controls on either side of the footplate; the conversion of existing engines would be expensive, but the matter would receive close attention when new steam shunting engines were being designed.

Types of Yard

The speaker went on to mention various types of shunting yards, as follows:—

Gravity Yards.—These depended upon a natural fall of the land throughout. The two best examples on the L.M.S.R. were Edge Hill (Liverpool), and Crofton (near Wakefield). At such yards there was a definite saving in shunting engine power, which usually outweighed the additional shunting staff necessary to apply and release the hand brakes on wagons to control their movement into the various sidings. The scope for introducing wholly gravity yards was limited, as, in order to cater for the worst running wagons, i.e., those with grease axleboxes, it was necessary to have at the critical points gradients of the order of 1 in 85 for loaded wagons and 1 in 70 for empty wagons.

Hump Yards.—The main difference between a hump yard and a purely gravity yard from an operating point of view was that in a hump yard it was necessary to employ a locomotive to propel the train to the apex of the hump; time was saved as compared with a flat yard, since the engine did not require to make reversing movements for each wagon or cut of wagons. The L.M.S.R. had some 23 hump yards of various sizes, the largest at Toton down sidings, which were at present in the process of being mechanised.

Flat Yards with Inclined Shunting Neck.—Some of the flat yards were provided with an inclined shunting-neck to assist the shunting engine in giving impetus to the wagons and to reduce reversing movements; they were useful where wagons with high running resistance predominated.

Flat Yards.—Most of the small yards were "flat," and so were many medium sized yards where physical considerations precluded natural or artificial aids to shunting.

Mechanised Yards.—Mechanisation was usually regarded as synonymous with the provision of rail brakes, and complementary modern equipment such as centrally controlled power worked points. At the moment there was no mechanised yard in operation on the L.M.S.R.; but the down sidings at Toton were being converted, and would be completed at Whitsuntide this year. The L.N.E.R. had already introduced mechanisation at Whitmoor up and down yards and at Hull inwards yard. The speaker said that, in the event of being able to justify certain new or remodelled yards, now under investigation, the L.M.S.R. would seriously consider incorporating rail brake working. Reverting to Toton, they had taken a bold step, as this yard had on occasions dealt with over 5,000 wagons in 24 hr., with an average of about 1½ wagons per cut over a single line hump under non-mechanised operations, a larger number than was dealt with over any single line hump in this and probably any other country. That number of wagons would at times have to be dealt with under mechanised working on certain days in the height of the winter in order to enable them to keep pace with the work. The pioneering work in the development of rail brakes had been done in Germany and the United States, and the reason why they had not been introduced to a greater extent in Great Britain was that in the previously mentioned countries the wagons were of greater capacity and were not all fitted with hand brakes as in this country. It should, of course, be understood that a mechanised yard incorporated a hump and gradients sufficiently steep to permit of the worst running wagons running the farthest distance required under the worst conditions, as regards curvature of tracks, weather, and other factors—the rail brakes taking up the slack in the good runner.

Non-Mechanised Yards

In many of their yards dealing with a throughput of 1,000 to 2,000 wagons daily they did not at present consider the provision of rail brakes and their collateral equipment justified; they were, however, examining all these yards, in order to see what, if any, alterations to the layout could be made with economical results to the shunting. Probably the most important feature, having regard to the density of traffic on the British railways as compared with most foreign lines, was that of providing arrival or reception sidings so that trains could be accepted thereon without having to wait one behind another on the main lines, thus reacting on main line working as a whole. These arrival or reception lines should preferably be in advance of the sorting sidings, so that sequential movement of the wagons took place, and the L.M.S.R. had several remodelling schemes under investigation with that object in view.

The main scope for modernisation of sorting sidings was in the design of the entrance end, and the one redeeming feature about sorting sidings generally was that the L.M.S.R. had inherited from the former constituent companies every conceivable type of yard, which had at least facilitated the more scientific study they had recently given to the subject. At all hump yards, whether mechanised or not, the distance from the hump to the king points and the immediate following-on points should be as short as possible to ensure early separation of wagons or cuts of wagons.

Oil v. Grease Axlebox Wagons

The speaker then referred to the difference in running characteristics of various wagons. Wagons fell into two main categories, *viz.* those with oil axleboxes and those with grease axleboxes, and also into two other categories, railway-owned and privately-owned, the railway companies' wagons being nearly all equipped with oil boxes. The fact of a wagon being loaded or empty had also to be considered. Formerly all wagons had grease axleboxes, and the original humps were designed to deal with this class of wagon, which was the slower running of the two, particularly in winter. A large proportion of privately-owned wagons, the majority used in coal traffic, still had grease boxes, and the two types became mixed, the oil box wagons tending to run too far if not carefully braked, and those with grease boxes in some instances failing to reach the clearance point and interrupting the shunting. Private owners were gradually converting their grease box wagons to oil, but it was likely to be many years before the grease box wagon disappeared, and in the meantime, it was a source of trouble in designing gravitation and hump yards and in improving the design of existing yards. To assist in overcoming the disability in actual practice, they had adopted the policy of raising the humps at a number of their yards in the autumn and lowering them again in the following spring.

Illumination

All large marshalling yards and most of the medium sized yards were open throughout the 24 hr. As the period of darkness in winter exceeded that of daylight, without artificial light during the night the rate of shunting would be extremely slow if ordinary safety precautions were observed; incidentally the period of the year when there was the least daylight synchronised with the heaviest coal traffic. With the speeding up of operations in recent years, first class illumination was desirable, and the most essential part of a yard requiring efficient lighting was in the point area, so as to avoid wagons for different sidings fouling one another. Lighting was provided by electricity (the most convenient), gas, and to a small extent oil. With gas they could get efficient yard illumination, but difficul-

ties were sometimes experienced with by-pass pilot lights failing, and the maintenance of burners, mains, &c., had to be of a high order to give the best results. There were minor yards remote from electricity or gas supplies, where oil lamps were used, but these installations were gradually being replaced. It had been proved that in fog and mist high floodlights were not satisfactory, low local lights being more efficient; research had also been conducted into fog dissipation, but a solution had not yet been found.

From the more scientific standpoint the speaker mentioned the question of reflection factor and light backgrounds. The provision of light-coloured ballast in the point area at modern mechanised yards had already been accepted as a means of assisting visibility from a pointsman's cabin, but the conditions at non-mechanised yards precluded the satisfactory use of light ballast owing to the difficulty of keeping it clean. Where bad visibility existed, experiments were being made in whitening backgrounds at some yards the tongues of points, stretcher bars, &c., were whitened, and they were contemplating tests by painting short portions of the hollow side of rails.

Communication

The speeding up of work and the avoidance of delay at traffic yards had emphasised the need for more efficient communication between inspectors, foremen and shunters working in different parts of the yard, and with signalmen. At places where the amount of traffic justified it, the L.M.S.R. was providing loudspeaker apparatus, with very satisfactory results, and amongst the other potential uses being tried out was the transmission of siding numbers during humping to the point-operating and braking staff. There was a case of an awkward layout which, owing to physical limitations, could not be altered, where all the yard staff had hitherto had to learn a "tic-tac" code for about 25 sidings, signs by hands and arms during daylight and combinations of hand lamp signals, red, white and green during darkness.

Yard Signalling

There was, the speaker said, a small code of signals for simple shunting operations, covering starting, stopping and setting back, which were given by the position of the shunter's arm in daylight and hand lamps at night. The length of rafts of wagons, unavoidable curvature of shunting necks, and also structures, sometimes impeded visibility, and mechanically operated bells, or gongs, were provided, with a lever near the shunter's working position, the number of rings according to a standard code indicating to the shunting engine driver whether he had to start, stop, set back, &c. Difficulty was often experienced with these mechanical bells

owing to expansion and contraction of the wire, and, as a result, electric gongs and plungers had been introduced, while latterly they had developed considerably a remotely operated klaxon horn with excellent results.

Other items receiving attention on the L.M.S.R. were:—

1. Subsidence of sidings over colliery workings.
2. The bunching of trains arriving at and departing from sidings.
3. Marshalling of traffic by traders at private sidings.
4. The positioning of odd wagons for traders in station yards.
5. Provision of fixed or mobile plants for testing vacuum fitted wagons.
6. Improving the standard of wagon labelling and label holders.
7. Provision of shunting necks and avoidance of use of main line for shunting.
8. Arranging layouts to ensure prompt liberation of train engines.

Much had been and was being done on the L.M.S.R. in the direction of re-arranging and mechanising goods stations. In the case of marshalling yards, however, it was an entirely different matter, for whereas a crate or package was amenable to handling in various ways, *i.e.*, by conveyor belts, platform trucks, cranes, yard lorries, barrows, or even by hand, a wagon had to travel on the rails provided. Actually they had considered sorting and marshalling wagons by gantry cranes, but this method would be too tedious, costly and uneconomic. The track layout was therefore the governing factor in modernising a marshalling yard, and each case had to be examined on its physical and economic merits.

In the Operating Department they had to accept the commercial conditions of the country, their duty being to accept wagons properly labelled, whether railway-owned or privately-owned, and convey them to destination with the utmost despatch. If the trade of the country were conducted in bulk train loads from sending point to destination, the sorting of wagons would be unnecessary and shunting would be infinitesimal, but special records taken at some of their large yards revealed that the average number of wagons per cut was usually about 1½, and this applied also to the privately-owned wagons whether loaded or empty.

Mr. Mauldin, in a short speech, thanked Mr. Royle for his excellent paper, and said that it was essential not only to reduce shunting-costs but also to speed up operation, both in regard to rapidity of delivery and also to the curtailment of shunting and staging delays *en route*. The L.N.E.R. Whitemoor yard had been a great success, giving them a 14 per cent. per annum return on the capital expended.

Willesden Marshalling Yard, L.M.S.R.

Visit of inspection by the Railway Students' Association

On Saturday, March 18, a number of members of the Railway Students' Association visited Willesden marshalling yard, L.M.S.R., in charge of Mr. L. W. Orchard, Chairman of the committee, and Mr. C. A. Nisbet, Joint Honorary Secretary. The visit served as an instructive preliminary to Mr. T. W. Royle's paper on "Modernisation of Marshalling Yards and Shunting Methods on the L.M.S.R.," read at the fifth ordinary meeting of the association on March 20, and summarised on page 518 of this issue.

Mr. J. Picknell, District Controller at Willesden, gave a concise outline of what the party would see in the course of the tour, after which the visitors, under the guidance of Mr. Picknell and his assistants, and Mr. R. C. Pickerell, in charge of shunting modernisation in the Chief Operating Manager's Office, were conducted through the main sections of Willesden yard. The tour embraced the Sudbury arrival roads and humps, low level and high level sorting sidings, where up traffic is classified and made up into trains, and also the sidings at Brent, where down traffic, consisting largely of colliery empties, is similarly dealt with. Mr. A. C. F. Calladine, Assistant (Passenger Services) to the Chief Operating Manager, was amongst those present.

A comprehensive demonstration was given to members of how trains are broken up and re-formed, as well as a summary of recent improvements introduced at Willesden. These comprised, amongst others, the substitution, in many instances, of diesel shunters for steam locomotives, with consequent saving in personnel, longer periods of uninterrupted work and more efficient hump-shunting; modification in the layout, consisting of an independent road which allowed the Sudbury hump-engine to run round without fouling incoming trains; loud-speaker communication between the yard foremen and Sudbury Junction box; track-circuits indicating whether arrival-roads were clear or occupied; klaxon horns to assist hump-engine drivers in foggy weather; ground indicators to show drivers of incoming trains where to stop; illumination (by means of spot-lights) to ensure good vision of the chalked siding numbers on wagon ends, and experimental slip-up and slip-down point indicators to facilitate the work of the yard staff. With regard to hump-working, it was stated that the combined effect of these and other improvements had been such as to curtail by 50 per cent. the average time needed to shunt one train—a matter of vital importance in a yard like Willesden, where immediately prior to the trade recession over 30,000 wagons were handled weekly.

The party was also shown one of the

vacuum-fitted 40-ton hopper wagons, with double-side discharging, used for conveying coal from Shipley colliery to the company's power station at Stonebridge Park; it was explained that these vehicles were made up into trains of 12 or 16 (according to the class of locomotive), and worked with such expedition that in the majority of instances they were back empty at the pit 24 hr. after leaving loaded. This method of operation, embodying direct running with full train-loads, without shunting or staging *en route*, and with a quick turn-round at each end, is the desideratum of all traffic officers.

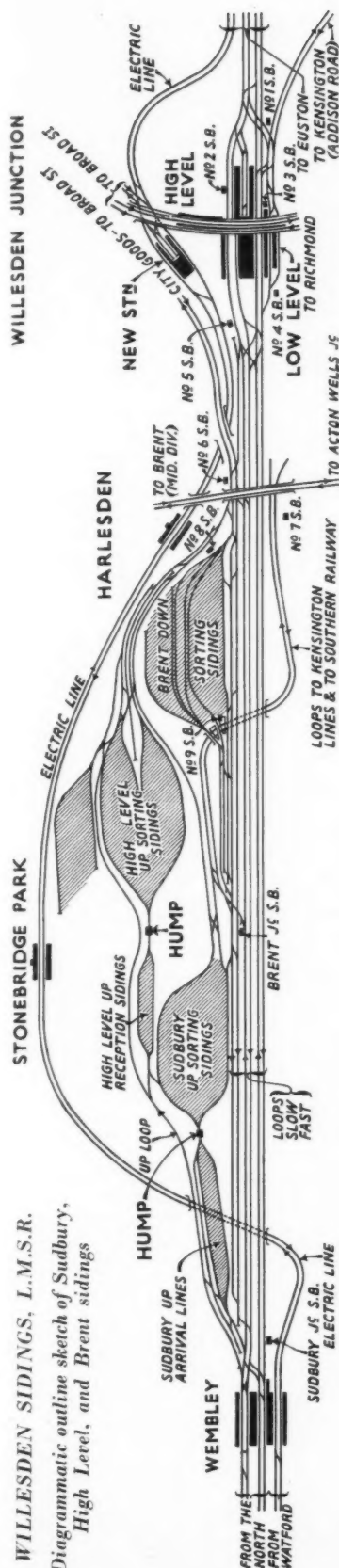
The L.M.S.R. Diesel Passenger Train

The L.M.S.R. streamlined three-car diesel articulated train, which until recently was making regular experimental runs on the Oxford and Cambridge branches, began on Monday last, March 20, a regular passenger service between London (St. Pancras), Luton, Bedford, Kettering, Leicester, Nottingham, and intermediate stations. It has taken the place of existing steam trains, and provides the first regular diesel passenger service to a London terminus. The train, which is streamlined and is painted aluminium and Post Office red, consists of three articulated cars. It weighs 73 tons in full working order, and seats 24 first class and 138 third class passengers. The six Leyland diesel engines, each developing 125 h.p. at 2,200 r.p.m., are capable of giving the train a speed of 75 m.p.h. and one of the schedules to which it is now working involves running the 19.6 miles from Luton to Bedford in 20 minutes at an average start-to-stop speed of 58.8 m.p.h. The diesel unit covers 350 miles daily, the services worked by it being as follow:—

5.50 a.m.	Bedford to St. Pancras.
11.20 a.m.	(11.10 on Sats.) St. Pancras to Leicester.
2.45 p.m.	Leicester to Nottingham.
5.25 p.m.	Nottingham to St. Pancras.
10.35 p.m.	St. Pancras to Luton.
11.45 p.m.	Luton to Bedford.

On Saturdays the 5.50 a.m. from Bedford will no longer terminate at Luton, but will run through to St. Pancras as on other days of the week. The 11.45 p.m. from Luton to Bedford is an entirely new service. A photograph of the train at St. Pancras station is reproduced on page 507.

REOPENING OF SCOTTISH SEASONAL HOTELS.—The L.M.S.R. seasonal hotels in Scotland will reopen for the 1939 season as follow: Gleneagles Hotel, Perthshire, on Tuesday, April 4, and both the Dornoch Hotel, Dornoch, and the Highlands Hotel, Strathpeffer, on Wednesday, May 24.



WILLESDEN SIDINGS, L.M.S.R.
Diagrammatic outline sketch of Sudbury, High Level, and Brent sidings

RAILWAY AND OTHER MEETINGS

British Automatic Co. Ltd.

The ordinary general meeting of the British Automatic Co. Ltd. was held at Winchester House, Old Broad Street, E.C., on March 22, Major R. D. K. Curling, M.C., Chairman and Managing Director of the company, presiding.

The Secretary (Mr. W. A. Ballard) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said that on the assets side of the balance sheet machines and fittings showed an increase of £11,715, which was made up of net additions during the year of £18,282 less amounts written off in respect of machines scrapped and sold £6,567. The net profit, before providing for depreciation of automatic machines, amounted to £50,367, against £48,309. To the year's profit should be added the balance from 1937 of £7,532, making a total of £57,719, from which £34,180 had been allocated to depreciation and renewals account. This left £23,539, and the directors recommended a dividend of 4 per cent., free of tax, which would absorb £16,000. This would be the one hundredth dividend declared by the company.

Last year, the Chairman continued, he expressed the hope that the 1938 figures would be as good as they then were, and they would see that the company had succeeded in showing a small increase in spite of the fact that in 1937 the company benefited from the Coronation and from traffic diverted to the railways by the London bus strike. The past year, after beginning full of promise, had been a difficult one. However, the company had been successful in obtaining the contract for placing machines in the grounds and amusement park of the Glasgow Exhibition. On the railways, they were naturally affected by the reduced number of passengers carried. During 1938 this was about 75,000,000 less than in 1937, and some 20,000,000 less than in 1936. This had meant a substantial reduction in the number of the company's potential customers, but in spite of this, slightly increased sales had been obtained, mainly due to the benefit from the extra machines placed out on the railways.

The Nestlé's milk chocolate sold in the company's machines proved very popular, and 600 tons of it were disposed of last year. The packets laid end to end would have stretched from the room in which they were meeting to Istanbul, or sufficient every six weeks to cover the area of Trafalgar Square. The number of packets manufactured by Reeves Limited, in Glasgow, every year ran into millions. The Churchman No. 1 cigarettes sold by the company also seemed very popular, due to the fine quality and packing. A chain smoker smoking eight hours a day for 50 years would only consume two months'

supply of those put through the company's machines every twelve months, and would require only one day's supply of book matches. One million booklets of matches were sold in a month.

There had been a small decrease in the weighing machine side of the company's business. However, 5,000 tons of wise people used their machines every day of the year, and the Chairman hoped they benefited in health by thus regularly watching their weight.

Holidays with pay had not increased revenue from their amusement business because large numbers of annual outings had been cancelled, and many people with holidays either stayed at home or went away for a week and found, after they had paid boarding expenses, they had little to spend on entertainment.

Trading results from Reeves Limited had been better. A considerable reorganisation of the business had been carried out and the company's efforts were meeting with success. Expenditure on materials and wages had increased

during the year, and this was very difficult to deal with because most of the company's services were provided at the fixed cost of one penny.

In considering the outlook for the present year, it was necessary to adopt a very cautious attitude, but he could assure the meeting they were doing everything they possibly could to secure their share of the business available by the introduction of new machines, the improvement in presentation and value of goods sold, and the continuance of the high standard of servicing efficiency which had enabled the company to maintain its position for over 50 years. Their relations with railway companies continued to be satisfactory, and the Chairman expressed his appreciation to the railway companies' officers for the helpful way they had always met them in matters of mutual interest. He also thanked all his colleagues on the board, and recorded his high appreciation of the General Manager, Mr. Timmins, and his staff. In addition to carrying out normal duties, many of their staff had qualified in A.R.P. and everything possible was being done to provide for the protection of staff should an emergency arise.

The report and accounts were unanimously adopted.

L.M.S.R. (London) Photographic Society Exhibition

Mr. W. A. Stanier, Chief Mechanical Engineer, L.M.S.R., opened the fourteenth annual exhibition of the L.M.S. (London) Photographic Society in the Shareholders' Meeting Room at Euston on March 20. Mr. H. V. Mosley, Chief Executive Officer for New Works and Parliamentary Business, presided at the ceremony. Before presenting the awards, Mr. Stanier admitted to having been a photographer himself for many years, and emphasised the value of pursuing a hobby in leisure hours. He drew attention to the care taken by entrants in securing an artistic composition of their pictures, and considered the variety of subjects was even greater than last year. Mr. A. J. Scrivener, Honorary Secretary of the society, said that a record number of entries had been submitted.

It was noteworthy that in the few instances where competitors had chosen subjects from their own sphere of employment, they did so with originality. In one case the inspiration was the pattern formed by the random grouping of bogie wheels and axles; another competitor, choosing the intriguing title "Love or Murder," had photographed a traveller selecting fiction for the journey at a station book-stall. Railway interest was given to a purely scenic picture, "A Highland Way," by making a single line of railway the central theme in a composition of hills, woods, and water. An honourable mention was gained by Mr. E. Hope's picture "The Early Local"—a view from a footbridge showing a train at a station and a sky and hori-

zon dark with morning clouds and the smoke of industry.

Among other subjects, sea and ship studies were as popular as usual among photographers, and there were several fine pictures of cloud formations. A novel twist was given to the latter type of study by an entrant in the lantern slide class, who set against the cloud background the nose and engines of a Railway Air Services liner. Winners of the principal awards were:

Members class: 1st, Mr. T. H. Lisner; 2nd, Mr. A. Rowley.
Open class: 1st, Mr. H. T. Morris; 2nd, Mr. R. R. Rawkins.

RAILWAYS ATHLETIC ASSOCIATION. CROSS-COUNTRY RACE.—The annual five-mile cross-country race of this association took place at Enfield Lock on Saturday, March 18, and the following were the results: Individual Championship: 1st, C. Salisbury, L.M.S.R., Derby; 2nd, E. Stimpson, G.W.R., London; and 3rd, T. Kibble, L.M.S.R., London. (Winners' time, 29 min. 10 sec.) Railway Group Championship (Buchanan & Co.'s Shield): 1st, L.M.S.R.; 2nd, G.W.R.; and 3rd, L.N.E.R. London Area Championship (late Mr. A. E. Bolter's Cup): Winner, G.W.R., London. Provincial Area Championship (Sir Herbert Walker's Cup): Winner, L.M.S.R., Derby. The race, for which there were 161 entrants, was started by Mr. H. S. Chapman (L.P.T.B.), and among those present were Messrs. W. M. Perts (S.R.), and W. O. Davies and W. J. Blake (L.M.S.R.) Mr. Chapman also distributed the prizes to the successful competitors.

RAILWAY AND OTHER REPORTS

Aire & Calder Navigation.—Net revenue for the year 1938 amounted to £149,558, as compared with £192,643 for 1937. Adding £73,854 brought forward makes a total of £223,412. The dividend for 1938 is 4 per cent., less tax, and requires £74,400. Transfers have been made of £10,000 to reserve account, £5,000 to superannuation fund, and £8,000 to contingencies fund, leaving £71,994 to be carried forward. For 1937 the dividend was 5 per cent., plus a bonus of 1 per cent.

Isle of Man Steam Packet Co. Ltd.—Net profit for the year 1938 is £36,900, and adding £15,646 brought forward, there is available £52,546, of which £36,000 is appropriated to a dividend of 6 per cent. for the year, leaving £16,546 to be carried forward. Total income shows a decrease and expenditure an increase, due mainly to higher wage costs. The profits have been arrived at after making provision for depreciation and towards replacement of ships, also for contingencies and taxation, and after making a contribution towards a staff pension fund, which it is intended to bring into operation on April 1. The *King Orry* is being converted to burn oil fuel. It is proposed to reduce the price of day tickets to the island from certain ports, and to comply to a limited extent with the demand for sundry sea excursions.

East Kent Light Railways Company.—Receipts from railway working in the year 1938 were £10,430, compared with £11,011 in 1937. Expenditure amounted to £9,030, against £9,175, and net receipts to £1,400. With a net revenue of £3,121 plus £25 brought in, the balance available, less tax written off £900, is £2,246, against £2,565. The present scheme of arrangement provides that the whole of the net annual revenue for the five years from January 1, 1934, be applied so far as required in paying interest on the £126,970 of 5 per cent. debenture stock in cash during that period, and that any remaining balance of such interest be cancelled. It is proposed to discharge the liability for the 1938 debenture stock interest by a payment equal to 1½ per cent., absorbing £2,222, and leaving £24 to be carried forward. Annual payments in cash, 1934-1937 inclusive, were 2 per cent.

Provincial Railways of Buenos Ayres.—Gross receipts of the Compagnie Générale de Chemins de fer dans la Province de Buenos Ayres for the year ended June 30, 1938, amounted to \$11,808,964 in Argentine currency, comparing with \$15,689,933 in 1936-37. Working expenses were reduced from \$11,957,163 to \$11,652,807, leaving net receipts of \$156,157. In French money, after adding sundry credits, including interest and exchange gains, and meeting all charges, there was a profit of fr. 900,491, which was appropriated to the renewals fund. The number of passengers increased from 2,436,687 to

2,474,932, but the tonnage of goods fell from 1,849,133 to 1,328,061. In cereals there was a fall of 512,000 tons, or 33 per cent. The total receipts were the worst for 19 years. Results for the previous year were exceptionally favourable and had the benefit of the carriage of two harvests. In that year a dividend was paid of 5 per cent., plus a supplementary dividend of fr. 15 a share.

British Automatic Co. Ltd.—Receipts from automatic machines in 1938 showed an increase over those of the previous year, and almost the whole of this is attributable to business obtained at the Empire Exhibition, Glasgow, where the company held the contract for automatic machines. Expenditure was higher, owing to heavier charges for wages and materials. Trading profit increased from £76,002 to £78,229, and the net profit, subject to depreciation of automatic machines, rose by £2,058 to £50,368. Adding £7,352 brought in makes a total of £57,720, out of which the directors have allocated £34,181 to depreciation and renewals account, and recommend a dividend of 4 per cent., tax free, which will require £16,000, leaving £7,539 to be carried forward.

Wm. Beardmore & Co. Ltd.—The directors recommend a dividend of 3½ per cent., less tax, on the ordinary stock for the period July 20 to December 31, 1938, equivalent to a rate of approximately 7½ per cent. per annum, less tax. This ordinary stock was issued in accordance with the scheme of arrangements sanctioned last July, and ranks for dividend under that scheme as from July 20 last. By that scheme the capital was reduced from £1,797,752 to £1,357,207, and the capital was increased by the issue of £950,000 preference (5½ per cent.) and £950,000 ordinary. The last dividend on the old ordinary capital was 6 per cent., tax free, in June, 1919. Net profits for the year ended December 31 last were £296,365, which compares approximately with £145,619 in 1937. It is proposed to allocate £160,000 to a preference stock dividend reserve, leaving £95,000 to be carried forward.

North British Locomotive Co. Ltd.—The report for 1938 shows a profit of £63,137, which deducted from the debit balance of £111,834 brought in, leaves £48,696 to be carried forward. For 1937 the profit was £1,946. In view of the substantial amounts written off in previous years, the directors do not consider it necessary to make further provision for depreciation in the meantime. There was a substantial improvement in turnover in 1938, but the general demand for locomotives, boilers, and spare parts is still insufficient to occupy the full capacity of the works, and this deficiency has not been entirely met by Government contracts of which the company has had a share. The locomotive contracts on which the

company has been engaged have all come from overseas purchasers, and in particular from British Colonies and Dominions, and, in the opinion of the directors, there is still no indication that the home railways are likely to re-enter the market.

John Baker & Bessemer Limited.—The profits for the year 1938 were £49,087, compared with £46,407 for 1937. The ordinary dividend is to be raised from 7½ per cent. to 10 per cent.

Clayton Dewandre Co. Ltd.—A final dividend is recommended on the ordinary stock of 5 per cent., making 8 per cent. for the year 1938, against 8½ per cent. for 1937. On the deferred stock it is proposed to pay 8 per cent. for 1938 (compared with 9½ per cent. for 1937), leaving £4,841 to be carried forward, against £2,940 brought in.

Thos. Firth & John Brown Limited.—The directors recommend a final dividend of 11½ per cent., free of tax, making 17½ per cent., free of tax, on the ordinary shares for the year 1938, the same as for 1937. Net profits, after charging directors' fees, debenture and mortgage interest, and depreciation and after making provision for income tax and N.D.C. amount to £515,056, compared with £537,681 for 1937.

British Thomson-Houston Co. Ltd.—The profit for 1938, after providing for all expenses but debenture and loan interest, and after setting aside £300,000 for income tax and N.D.C. was £670,644, comparing with £651,673 for 1937. It is proposed to apply £226,941 to depreciation, to add £200,000 (against £100,000) to general reserve, and again to pay a 7 per cent. dividend on the ordinary shares, leaving £182,829 to be carried forward, against £206,408 brought in. The volume of orders was somewhat less than the high record of 1937. Output from the works was the largest in the history of the company and the unexecuted orders on hand at December 31, 1938, were, in consequence, not quite as large as at the end of 1937.

G. D. Peters & Co. Ltd.—A net profit is reported for 1938 of £102,767, against £38,295 for the year 1937. In addition, a profit of £11,000 was realised on the sale of an investment in a subsidiary. Sums are appropriated of £1,360 to capital issue expenses, of £8,500 to taxation, of £5,000 to staff pensions, and of £71,250 to general reserve. An interim ordinary dividend of 10 per cent. has already been paid and the directors now recommend a final ordinary dividend of 15 per cent., making 25 per cent. for the year. In 1937 the capital was reorganised and the dividend at the rate of 15 per cent. per annum was in respect of the five months ended December 31 in that year. The 1938 dividend is payable on a capital increased by the issue of 100,000 ordinary 5s. shares. The amount to be carried forward is raised from £4,392 to £13,698.

NOTES AND NEWS

The Coronation Scot in America.

—Over 16,600 people inspected the L.M.S.R. Coronation Scot train at Baltimore on March 21, the first day of its exhibition tour of 31 American cities and towns. In the course of brake tests on the B. & O. system as a preliminary to its tour, the train is stated to have attained 85 m.p.h.

German Rolling Stock Programme.—The German State Railways has announced its new rolling stock programme for 1940-43. It includes 6,000 locomotives, 10,000 passenger coaches, 112,000 goods and luggage vans, and 17,300 motorcars and lorries. The total cost is estimated at RM. 3,500,000,000 (about £280,000,000).

Canadian Transcontinental Air Mail.—A night mail service across Canada from Montreal to Vancouver was inaugurated by Trans-Canada Air Lines (the C.N.R. associate) on March 1. Stops are made at Ottawa, Toronto, North Bay, Winnipeg, Regina, Lethbridge, Calgary, and Edmonton. It is hoped to inaugurate a passenger service over the same route early in April.

Another Judicial Accident Inquiry in India.—A press message from New Delhi indicates that a judicial inquiry into the cause of the derailment on January 12 near Hazaribagh Road on the East Indian Railway Grand Chord line—very definitely attributed in the Government Inspector's report to sabotage—is to be conducted by a Judge of the Bombay High Court and two other high judicial officers.

"Square Deal" Developments.—The special committee of the Transport Advisory Council has now completed its report upon the railway companies' claims, and the document will be submitted to a full meeting of the council which has been summoned for April 4. As the majority of the members of the council were members of the committee, it seems probable that the report will be approved, after which it will be forwarded to the Minister of Transport for consideration. An announcement as to the date when the necessary legislation will be introduced is therefore unlikely to be made for some weeks.

French Railway Loan.—Negotiations with a Swiss banking group for the issue of a six-year 3½ per cent. loan of Swiss fr. 315,000,000 (£15,750,000) to the French National Railway Company are practically completed, *The Financial Times* understands. The proceeds are to be used to redeem the Swiss fr. 200,000,000 two-year 4 per cent. loan issued by all former French railway companies jointly. The balance might be used to pay off the Swiss and Dutch credits granted to the French railways through the French Treasury, of which Swiss fr. 35,000,000 (£1,750,000) matured on Wednesday of last week, March 15.

German Railway Accident.—The Berlin-Sassnitz express, connecting with the train ferry to Trelleborg, in Sweden, was derailed near Greissenberg on Monday night, March 20. Six carriages are reported to have left the rails, and the engine driver was killed and several passengers injured.

Central Railroad of New Jersey.—According to reports in financial circles a drastic reduction in the fixed interest charged has been informally suggested to large bondholders in the Central Railroad Company of New Jersey, with the amount of the interest reduction to be placed on a contingent basis.

Memel.—A further European territorial change has taken place this week in the transfer of Memelland from Lithuania to Germany. Under the peace settlement the Memel district was established as a free territory under French administration, in view of its situation as a German port serving a non-German hinterland. In January, 1923, it was captured by Lithuanians, and the Conference of Ambassadors accepted the *fait accompli*, but insisted on Memelland becoming an autonomous territory. In response to a German ultimatum, Lithuania withdrew on Tuesday last, March 21, and Reich sovereignty was assumed on Thursday.

New Metropolitan Line Services, London Transport.—On Monday next, the first eight-car train to be run from Barking to the Metropolitan Line will leave for Rayners Lane. A night rush-hour service will also be provided. Twenty-one eight-car trains of the newest type, with air-worked doors, are shortly to replace the existing six-coach Metropolitan trains. This has been made possible by the reconstruction of Aldgate East station. Tube stock of the Bakerloo type will be introduced on Monday on the shuttle service between Wembley Park and Stanmore, to enable the staff to become accustomed to this type of train before the regular service to the Metropolitan Line is begun later this year through the new tunnels now being completed between Baker Street and Finchley Road.

L.M.S.R. (London) Amateur Musical Society.—On Thursday, Friday, and Saturday of this week (March 23-25), the L.M.S.R. (London) Amateur Musical Society is presenting at the Scala Theatre, Oscar Hammerstein's famous musical play "Show Boat." Judging by the performance at the guest night on Wednesday, which we attended, this production is outstanding among the society's achievements. The many principals in a lengthy *dramatis personæ* were invariably adequate and in a number of instances really good. Moreover, they were well supported by

good chorus work which never lost the team spirit. Particularly deserving of mention were Mr. Arthur Lloyd as "Gaylord Ravenal," Miss Marjorie Ellisdon as "Ellie," Miss Lucy Sander as "Julie," Mr. Fred Bishop as "Frank Schulz," Mr. Jack Pegg as "Ol' Man River Joe," and Mr. Reginald Brockwell as "Cap'n Andy Hawk." The production is under the personal direction of Mr. Arthur C. Chapman. The excellent orchestra was provided through the co-operation of Lloyd's Light Orchestra under its Musical Director, Mr. Arthur Waller.

Tralee & Dingle Line to Close.—The Great Southern Railways Company (Eire) has announced that the Tralee & Dingle light railway is to be closed to passenger traffic on April 17. The main line from Tralee to Dingle will remain open for goods traffic, but the branch line to Castlegregory will be closed completely. This 37½ miles of 3-ft. gauge light railway was opened on March 31, 1891, and became part of the Great Southern Railways at grouping in 1925.

London Passenger Fares.—The Railway Rates Tribunal consisting of the three permanent members and two members specially added for the purpose began, on Monday, at Niblett Hall, Inner Temple, E.C., to hear the application of the four main-line companies and the London Passenger Transport Board for sanction to a five per cent. increase in certain fares within the London Passenger Transport Area. The scope of the inquiry is set out in an editorial article at page 492. The whole of the first day's, and a large part of Tuesday's proceedings, were taken up by the opening address of Sir Walter Monckton, K.C., for the applicants. On Tuesday afternoon evidence was given on the pooling agreement between the L.P.T.B. and the main-line companies, by Mr. Frank Pick, Vice-Chairman of London Transport, and the Tribunal adjourned until yesterday. Numerous objections to the application are being made and the proceedings are likely to be lengthy.

G.W.R. Smoking Concert.—Edward German's comic opera "Tom Jones," in the concert version, was the principal item of the G.W.R. (London) Musical Society's programme at the Queen's Hall on March 16. Lord Palmer, President of the society and Deputy Chairman of the Great Western Railway, was in the chair. The society was augmented by the Swindon choir and orchestra. Professional artists who took part as soloists in "Tom Jones" and also sang in the variety programme that followed were Nan Maryska, Joyce Newton, George Pizzey, and Scott Joynt. Norman Long entertained. A particularly warm reception was accorded to a choral composition by Mr. Geoffrey Cavendish, a clerk in the Registration Office at Paddington, whose piece, entitled "Captains Three," expressed confidence in the powers of Hope, Faith, and Love to solve the

problems of a distracted world. It was sung by Robert Scott, with a male voice chorus. The concert was conducted by Mr. W. H. Reed, who for many years was leader of the London Symphony Orchestra. Among the Great Western Railway directors and officers present were :—

Lord Palmer, Deputy Chairman; Major the Hon. J. J. Astor, the Hon. A. W. Baldwin, Lord Cadman, the Hon. E. C. G. Cadogan, directors; Messrs. H. Adams Clarke, Staff Assistant to General Manager; F. C. A. Coventry, Superintendent of Road Transport; C. R. Dashwood, Chief Accountant, F. R. E. Davis, Secretary; F. H. D. Page, Signal Engineer; H. W. Payne, Principal Assistant to Chief Goods Manager; A. G. Pollard, Assistant to Chief Accountant, R. A. P. Setterfield, Manager, Hotels, Refreshment Rooms and Restaurant Car Services.

Air Services Linking South Coast Resorts.—Portsmouth, Southsea & Isle of Wight Aviation Limited has been granted a seven-year licence for its Portsmouth-Ryde service, and a two-year licence for an experimental summer service between Portsmouth and Lea (I.O.W.) airport. A five-year licence has also been given for a Southampton-

Ryde service. The company and Channel Air Ferries Limited have been given permission for five years to run joint services between Shoreham, Sussex, and Bournemouth *via* Ryde (summer only), and Bournemouth and Ryde (*via* Southampton when approved by authority).

Road Accidents.—The Ministry of Transport return for February of persons killed or injured in road accidents is as below. The figures in brackets are those for the corresponding period of last year :—

	Killed	Injured
England—		
Pedestrians ...	222 (218)	4,668 (4,564)
Others ...	189 (177)	7,629 (7,426)
Wales—		
Pedestrians ...	11 (11)	196 (185)
Others ...	4 (10)	295 (281)
Scotland—		
Pedestrians ...	2 (27)	577 (532)
Others ...	12 (19)	550 (572)

The total fatalities for the preceding month were 486, compared with 521 in the corresponding period of last year.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 11th Week			Totals to Date		
	1939	1938	Inc. or Dec.	1939	1938	Inc. or Dec.
L.M.S.R. (6,831 mls.)	£	£	£	£	£	£
Passenger-train traffic...	398,000	405,000	— 7,000	4,211,000	4,304,000	— 93,000
Merchandise, &c. ...	483,000	513,000	— 30,000	4,782,000	5,347,000	— 565,000
Coal and coke ...	287,000	281,000	+ 6,000	3,331,000	3,391,000	— 60,000
Goods-train traffic ...	770,000	794,000	— 24,000	8,113,000	8,738,000	— 625,000
Total receipts ...	1,168,000	1,199,000	— 31,000	12,324,000	13,042,000	— 718,000
L.N.E.R. (6,320 mls.)						
Passenger-train traffic...	269,000	266,000	+ 3,000	2,807,000	2,857,000	— 50,000
Merchandise, &c. ...	331,000	359,000	— 28,000	3,322,000	3,785,000	— 463,000
Coal and coke ...	257,000	262,000	— 5,000	2,918,000	3,082,000	— 164,000
Goods-train traffic ...	588,000	621,000	— 33,000	6,240,000	6,867,000	— 627,000
Total receipts ...	857,000	887,000	— 30,000	9,047,000	9,724,000	— 677,000
G.W.R. (3,737 mls.)						
Passenger-train traffic...	167,000	170,000	— 3,000	1,786,000	1,804,000	— 18,000
Merchandise, &c. ...	205,000	209,000	— 4,000	2,042,000	2,187,000	— 145,000
Coal and coke ...	117,000	120,000	— 3,000	1,281,000	1,407,000	— 126,000
Goods-train traffic ...	322,000	329,000	— 7,000	3,323,000	3,594,000	— 271,000
Total receipts ...	489,000	499,000	— 10,000	5,109,000	5,398,000	— 289,000
S.R. (2,140 mls.)						
Passenger-train traffic...	261,000	271,000	— 10,000	2,857,000	2,873,000	— 16,000
Merchandise, &c. ...	61,000	66,500	— 5,500	613,000	658,500	— 45,500
Coal and coke ...	34,000	35,500	— 1,500	404,000	418,500	— 14,500
Goods-train traffic ...	95,000	102,000	— 7,000	1,017,000	1,077,000	— 60,000
Total receipts ...	356,000	373,000	— 17,000	3,874,000	3,950,000	— 76,000
Liverpool Overhead ...	1,220	1,281	— 61	14,488	14,805	— 317
(6½ mls.)						
Mersey (4½ mls.) ...	4,351	4,328	+ 23	49,020	47,982	+ 1,038
*London Passenger Transport Board ...	559,400	565,300	— 5,900	21,525,500	21,326,900	+ 198,600
IRELAND						
Belfast & C.D. pass. (80 mls.)	1,642	1,710	— 68	18,235	18,228	+ 7
" " goods	467	425	+ 42	4,732	4,786	— 54
" " total	2,109	2,135	— 26	22,967	23,014	— 47
Great Northern pass. (543 mls.)	10,800	9,750	+ 1,050	91,350	89,050	+ 2,300
" " goods	10,500	9,750	+ 750	104,700	94,300	+ 10,400
" " total	21,300	19,500	+ 1,800	196,050	183,350	+ 12,700
Great Southern pass. (2,076 mls.)	30,929	30,447	+ 482	305,208	307,955	— 2,747
" " goods	37,125	35,093	+ 2,032	441,879	448,397	— 6,518
" " total	68,054	65,540	+ 2,514	747,087	756,352	— 9,265

* 38th week (before pooling)

British and Irish Railway Stocks and Shares

Stocks	Highest 1938	Lowest 1938	Prices	
			Mar. 22, 1939	Rise/Fall
G.W.R.				
Cons. Ord. ...	65½	25¾	25½	— 4
5% Con. Prefce. ...	118¾	74	80	— 4
5% Red. Pref. (1950) ...	111¾	90	90	— 4
4% Deb. ...	111	97½	96	— 3½
4½% Deb. ...	112½	100½	98	— 3
4½% Deb. ...	118½	104	106	—
5% Deb. ...	131½	119	115½	—
2½% Deb. ...	69¾	60	61½	—
5% Rt. Charge ...	129	114	107½	— 3
5% Cons. Guar. ...	128½	103	101	— 4
L.M.S.R.				
Ord. ...	30½	11	12½	— 1½
4% Prefce. (1923) ...	70½	23	30½	— 6
4% Prefce. ...	82½	43½	49½	— 7
5% Red. Pref. (1955) ...	103½	66	73½	— 3
4% Deb. ...	105½	85	90	— 4
5% Red. Deb. (1952) ...	114½	105	107½	—
4% Guar. ...	102¾	77½	80	— 6½
L.N.E.R.				
5% Pref. Ord. ...	89½	31½	4	— 1
Def. Ord. ...	47½	21½	2½	— 5½
4% First Prefce. ...	68½	21	26½	— 5½
4% Second Prefce. ...	27½	8	10½	— 2½
5% Red. Pref. (1955) ...	97	40½	47½	— 2
4% First Guar. ...	97½	68½	68	— 6½
4% Second Guar. ...	91½	52	56½	— 7
3% Deb. ...	79½	60	64	— 3½
4% Deb. ...	104½	77	84	— 3½
5% Red. Deb. (1947) ...	110½	97	102½*	— 3
4½% Sinking Fund Red. Deb. ...	108½	101	100	— 2
SOUTHERN				
Pref. Ord. ...	87	47½	63	— 6
Def. Ord. ...	21½	9¼	14	— 2½
5% Pref. ...	115	83	91½	— 5
5% Red. Pref. (1964) ...	115½	98	95½	— 2
5% Guar. Prefce. ...	128½	106	107	— 1½
5% Red. Guar. Pref. (1957) ...	116	109½	109	— 1½
4% Deb. ...	109½	95	95	— 3½
5% Deb. ...	129	117	113½	—
4% Red. Deb. 1962-67 ...	107	101½	101½	—
BELFAST & C.D.				
Ord. ...	4	3½	4	—
FORTH BRIDGE				
4% Deb. ...	102	99½	96½	—
4% Guar. ...	103½	94½	94	—
G. NORTHERN (IRELAND)				
Ord. ...	5½	2½	3½	—
G. SOUTHERN (IRELAND)				
Ord. ...	25½	8½	10	+ 1½
Prefce. ...	35	13	12½	—
Guar. ...	70½	30½	30½	—
Deb. ...	83	56	51½	+ 1½
L.P.T.B.				
4½% "A" ...	119½	107½	110	— 3½
5% "A" ...	130	117	117½	— 4
4½% "T.F.A." ...	108	98	103½	—
5% "B" ...	122½	105	110	— 4½
"C" ...	84	68	72½	— 5
MERSEY				
Ord. ...	24½	16½	22	—
4% Perp. Deb. ...	102½	94½	94½	—
3% Perp. Deb. ...	77	69	66½	—
3% Perp. Prefce. ...	66½	57	55	—

* ex dividend

CONTRACTS AND TENDERS

L.N.E.R. Electric Traction Equipment Orders.

The General Electric Co. Ltd., as announced in our issue of March 17, has received an order from the L.N.E.R. for the complete electric traction train equipments in connection with the multiple-unit rolling stock required for the Manchester-Glossop-Hadfield section. The equipment ordered, all of which will be manufactured at the Wotton Engineering Works of the G.E.C., comprises motors, control gear, auxiliaries, heating, lighting, and automatic door gear wiring for eight three-car trains. The nominal supply voltage of the line is 1,500 d.c., but provision has to be made for line pressures up to 1,800 volts on account of the use of regenerative braking by the locomotives to be employed on this line. The new trains will consist of one motor coach, one driving trailer coach, and one composite trailer coach. Each motor coach will be equipped with four self-ventilated traction type motors having a one-hour rating of 220-b.h.p. each, while the control gear will be of the electro-pneumatic unit-switch type and will be mounted beneath the car underframes.

The English Electric Co. Ltd., as also recorded in our issue of March 17, has received an order in connection with the electrification of the L.N.E.R. lines from Liverpool Street to Shenfield and the branch line from Fenchurch Street to Stratford. The total extent of the contract comprises complete electrical equipment for ninety-two three-coach trains each comprising motor coach, trailer coach, and driving trailer coach. Operation will be from overhead line at 1,500 volts direct current. Each motor coach equipment will consist of four traction motors of 210-h.p. each, operated by electro pneumatic control gear, mounted on the coach underframe. Heating will be supplied at 1,500 volts, and a motor generator in each motor coach will supply current at 50 volts for lighting and control operation. The motors and control equipment will be manufactured at the English Electric Company's Bradford works.

John Spencer & Sons (1928) Limited has received an order from the South Indian Railway Administration, to the inspection of Messrs. Robert White & Partners, for 260 helical springs.

Thos. Smith & Sons (1928) Limited has received an order from the Bengal-Nagpur Railway for one boiler for a 15-ton travelling crane.

William Beardmore & Co. Ltd. has received an order from the Egyptian Delta Light Railways Administration, to the inspection of Messrs. Rendel, Palmer & Tritton for 170 carriage and wagon axles and 286 locomotive, carriage, and wagon tyres.

It is learned in Warsaw that the Turkish State Railways Administration

has given an order to the Polish Silesian works for 4,500 tons of rails, says Reuters Trade Service. The value of the order is said to be 1,500,000 zlotys.

Diesel Railcars for Peru and Jamaica

D. Wickham & Co. Ltd. has received an order from the Peruvian Corporation for five passenger railcars, including two having accommodation for 50 first class passengers and lavatory and two for 74 second class passengers. The cars are for operation in pairs and each will have a Saurer diesel-engined power bogie with BXD six-cylinder engine developing 200 h.p. at sea level and 160 h.p. at 15,000 ft., with Buchi supercharger, Sinclair fluid coupling, Hardy-Spicer cardan shaft and Cotal epicyclic electric gearbox.

D. Wickham & Co. Ltd. has also received orders from the Crown Agents for the Colonies for two double-power bogie diesel-mechanical railcars for service on the Jamaica Government Railways and constituting a repeat order of the railcar with Perkins engine and Mylius gearbox which, as recorded on this page of our July 1, 1938, issue, was ordered from D. Wickham & Co. Ltd. by the same administration.

D. Wickham & Co. Ltd. has also received orders from the Sudan Railways for two petrol-engined inspection railcars.

Wagons for F.M.S.R.

The Birmingham Railway Carriage & Wagon Co. Ltd. has received an order from the Crown Agents for the Colonies for 30 bogie high-sided wagons for the Federated Malay States Railways.

The Egyptian State Railways Administration has placed orders for wire and cable (Ref. No. E.S.R. 330G3/13) divided as follow:

Trefileries & Laminaires du Havre: Item No. 1, total cost approx. £2,415, f.o.b. Havre.
Nederlandsche Kabelfabrik: Item No. 2, total cost approx. £394, f.o.b. Rotterdam.
Hackethal Draht & Kabelwerk: Item No. 3, total cost approx. £2,059, f.o.b. Bremen.

The Crown Agents for the Colonies have recently placed the following orders:—

Brown, Lennox & Co. Ltd.: Anchors.
T. Bolton & Sons Ltd.: Cadmium copper wire.

J. Baker & Bessemer Limited: Carriage and wagon tyres.

Thos. Firth & John Brown Limited: Carriage and wagon tyres.

Taylor Bros. & Co. Ltd.: Carriage and wagon tyres.

Stanton Ironworks Co. Ltd.: Cast-iron piping and specials.
Wolverhampton Corrugated Iron Co. Ltd.: Corrugated sheets.

W. C. Jones Limited: Cotton waste.
English Drilling Equipment Co. Ltd.: Drilling materials and plant.

Callender's Cable & Construction Co. Ltd.: Dry core telephone cable.

Ferguson, Pailin Limited: E.h.t. and l.t. switchgear.

Whitecross Co. Ltd.: H.d. copper and steel wire.

J. Lang & Sons Limited: Lathe.
Hunslet Engine Co. Ltd.: Locomotive boiler.
Steel, Peech & Tozer: Locomotive tyres.

The Britannia Engineering Co. Ltd. has received an order from the Indian Stores Department for 2,000 broad-gauge coupling screws without hook shackles, pins, and rivets, at a total price of Rs. 34,875 f.o.r. Storespura.

Coaches for Egypt

Baume & Merpent has received an order from the Egyptian State Railways Administration for 40 third class all-steel bogie coaches, standard gauge.

A railways programme costing £8,910,000 was announced by Mr. A. P. J. Fourie, Minister of South African Railways and Ports, when he introduced the Railways Budget for the coming year into the Union House of Assembly on March 16. Working during the financial year 1938-1939, Mr. Fourie stated, had resulted in a deficit of £1,327,819, compared with an estimated surplus of £4,841. Revenue, including £320,000 brought forward from 1937-38, amounted to £38,561,000.

Locomotive Boilers Required for India

The Controller of Stores, North Western Railway, India, is calling for tenders (No. 210—s/18/15) for the supply and delivery of: 20 superheated locomotive boilers for SP/s (4-4-0) class and eight for SG/c (0-6-0) class. Tenders should be addressed to the General Manager, North Western Railway, Lahore, to be received by April 18.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department (Engineering Section), New Delhi, receivable by April 26, for the supply for the East Indian Railway workshops at Moghalserai and Lillooah of one 12½-in. sliding, surfacing, and screw-cutting gap bed lathe; one 1-in. mild steel and 1¼-in. dia. cast-iron capacity vertical drilling machine; one 8-ft. bed × 8½-in. centre sliding, surfacing and screw-cutting gap bed lathe; one 22-in. stroke shaping machine; and one 8½-in. centre × 8-ft. tool room lathe.

Tenders are invited by the Egyptian State Railways Administration, receivable at the General Management, Cairo, by April 17, for the supply of 50 brake vans. Tenders are also invited receivable by April 13, for the supply of steel box trucks.

The Argentine State Railways Administration is calling for tenders (No. 126/39) for the supply and delivery of 30 complete sets of steel points and crossings (15 right hand and 15 left hand) for Argentine rail 25 kg., tangent 0-10, track of one metre gauge. Tenders made out on stamped paper, should be enclosed in sealed envelopes addressed to the Departamento de Explotacion Comercial (Almacenes), Ferrocarriles del Estado, Avenida Maipu No. 4, Buenos Aires, to be received by April 18. A deposit of 1 per cent. of the total value of the offer is required in order to qualify any tender. A copy of the specification and conditions of tender (in Spanish), together with a set of blue prints, may be borrowed from the Department of Overseas Trade. Local representation is essential.

STAFF AND LABOUR MATTERS

Unemployment Insurance

The report of the Unemployment Insurance Statutory Committee contained the recommendation that legislation should be passed to secure that holidays should not be treated as days of unemployment for benefit purposes and a recommendation, by a majority, that contributions should be payable not only in respect of recognised paid holidays as at present but also in respect of any holiday period if the worker receives payment with a view to expenditure during that period. The Government has now presented to Parliament a Bill for the purpose of giving effect to the Statutory Committee's recommendations and also extending the same principles to Health and Pensions Insurance. The Bill also extends the classes of dependants in respect of which an increase of benefit may be paid. The cost, which cannot be estimated precisely but may be of the order of £100,000 a year, will fall on the Unemployment Fund.

Other provisions of the Bill are to correct an interpretation of the Unemployment Insurance Acts which permits the receipt of benefit in certain cases in excess of the periods mentioned in those Acts; to simplify the crediting of contributions to persons continuing to receive whole-time education by fixing the age of fourteen as the date from which contributions are to be credited after September 1, 1939; and to extend the Minister's powers to provide training courses to persons between 16 and 18 years of age, subject to certain conditions; and to members of the armed forces; the clause also extends the Minister's power to make payments to persons attending training and certain other courses.

Reduction of Hours of Work in Rail Transport

When the Government Body of the International Labour Office met in London last October, it was decided (as recorded in our issue of November 4) to convene a preparatory technical tripartite conference on the reduction of hours of work in rail transport, and the conference opened at Geneva on Monday last, March 20. The British Government delegate to the conference was Mr. F. W. Leggett, Ministry of Labour, with Mr. M. A. Bevan as adviser. For the railway companies the delegate was Mr. C. M. Jenkin Jones, Divisional General Manager, London & North Eastern Railway, York, with Mr. H. H. Halliday and Mr. H. S. Kirkaldy as advisers. The British workers' delegate was Mr. John Marchbank, General Secretary, National Union of Railwaymen. His advisers included Mr. W. J. R. Squance, General Secretary, Associated Society of Locomotive Engineers and Firemen; Mr. F. B. Simpson, M.P., Assistant General Secretary, Railway Clerks' Association; and Mr. R. Open-

shaw, Amalgamated Engineering Union. Mr. C. M. Jenkin Jones and Mr. John Marchbank were elected vice-presidents.

In addition to the British Empire,

the following countries are represented: The United States, Belgium, Brazil, Chile, Cuba, Denmark, France, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Sweden, Switzerland, and Uruguay. Colombia, Mexico, and Yugoslavia have sent observers.

QUESTIONS IN PARLIAMENT

Training Facilities for Railway Employees

Major-General Sir Alfred Knox (Wycombe—U.), on March 15, asked the Minister of Transport if he would consult with the leading railway companies in order to induce them to grant to junior Territorial officers the same facilities as were given by other large commercial undertakings to enable them to attend annual training or courses of instruction without personal pecuniary loss.

Dr. Leslie Burgin (Minister of Transport): I am in communication with the main-line railway companies on this matter.

Sir Alfred Knox: Will the Minister do his best to get better terms for these Territorial officers in view of the fact that the pay they get does not compensate them for their loss of salary?

Dr. Burgin: I am well informed of the position and I shall be seeing the general managers.

Smoke Abatement

Mr. B. V. Kirby (Everton—Lab.), on March 20, asked the Minister of Health whether the L.M.S.R. had yet started its series of experiments in methods of

firing locomotives; if so, what were the nature and results of such experiments; and what effect had been produced towards mitigating the smoke nuisance in the central area of Liverpool?

Mr. Walter Elliot (Minister of Health): I am informed that these experiments are now in progress and are being carried out in conjunction with measurements by the Liverpool Town Council of the state of the atmosphere at tunnel openings. Until the experiments are completed it will not be possible to assess their result.

Parliamentary Notes

Unopposed Railway Bills

The London & North Eastern Railway (Superannuation Fund) Bill and the London Midland & Scottish Railway Bill, being unopposed, have been referred to the House of Commons Committee on Unopposed Bills. The Mumbles Pier Bill, originating in the House of Lords, which contains a clause relative to the abandonment of a part of the Swansea & Mumbles Railway, is now unopposed in the House of Lords.

G.W.R. (London) Golfing Society

The first annual dinner of the Great Western Railway (London) Golfing Society was held on Friday, March 17, in the new Dining Club, Paddington, when the members attended in force and thus ensured a successful evening.

Among a number of distinguished visitors were Lord Portal and Mr. C. J. Hambro, two members of the company's directorate.

Officers of other railway companies who attended included: L.M.S.R., Messrs. H. V. Mosley, Chief Executive Officer for New Works and Parliamentary Business; W. A. Stanier, Chief Mechanical Engineer; G. Morton, Chief Accountant; C. H. Sutherland, Assistant Accountant; and V. Radford, Assistant to Accountant. Southern Railway, Messrs. R. G. Davidson, Joint Accountant; W. J. Sawkins, Assistant Accountant; E. F. Marsh, Assistant to Accountant.

Lord Portal's speech in proposing the toast of "The Society" was marked by many witty and amusing anecdotes. Mr. Cyril R. Dashwood (Captain), replying on behalf of the society, was also in good form. The presentation of prizes was made by Mr. Charles J. Hambro, who delighted his audience in announcing that Lord Portal and he would present two cups for foursome competition and said he would then find himself in a new relationship with his co-director.

Mr. F. R. E. Davis, Secretary of the

company, gave the toast of "The Visitors" with his usual light and charming touch. Mr. H. V. Mosley, Chief Executive Officer for New Works and Parliamentary Business, London Midland & Scottish Railway, replying for the visitors, referred, among other things, to the match played against the society when they failed to record a win and said he expected a different result this coming year. Mr. W. R. Williams, of *The Times*, also responded on behalf of the visitors and further delighted his audience with a fine rendering of "The Mountains of Mourne."—G.F.W.

HOFFMANN MANUFACTURING CO. LTD.—Presiding at the annual general meeting of this company on March 15, the Chairman, Mr. Robert Armitage, said that the year 1938 had been one of continued success. Fresh records had been made and the company was fully maintaining its share of the normal trade of the country. The difficulties of export trade had not become less, but the directors felt that the company was maintaining its position and indeed was improving it in a very interesting way in certain markets.

Railway Share Market

The tension in European affairs has entirely dominated sentiment on the Stock Exchange and values in all sections of the stock and share markets have declined sharply. On Monday prices were lowered by jobbers as a precautionary measure, but as no exceptionally heavy selling was witnessed, markets showed a somewhat better tendency on Tuesday. Subsequently, however, there was a further reaction, and it is generally expected that for the time being the day-to-day trend of the Stock Exchange will continue to be influenced by the nature of the latest developments in the international situation.

Home railway securities have moved closely with the surrounding tendency of markets, despite the hopes attaching to the "square deal" and the traffic outlook. The traffic figures for the past week were in accordance with most expectations with the exception of those for the L.M.S.R. and L.N.E.R. which showed rather larger decreases than had been generally estimated. It is being anticipated that later in the year the weekly receipts of all the main-line railways

should show an upward trend, granted there is no material set-back in the trade position. Prior charge and guaranteed stocks, as well as junior securities, have moved sharply against holders, but this does not reflect any less hopeful views as to the outlook. In most cases prior charge stocks are regarded as giving attractive yields at current levels, bearing in mind their good investment merits, and they will be expected to recover strongly when there is a sustained rally on the Stock Exchange.

Southern stocks have tended to attract attention on any decline, sentiment being assisted by the application for increased fares in the London area. According to some views, if the latter is granted there will be a prospect of a return of the deferred stock to the dividend list in respect of the current year, although only a fractional payment would require a substantial improvement in net receipts, bearing in mind the increased sum now required for debenture interest. Southern deferred fluctuated around 14 and the preferred around 63, while the 5 per cent. preference was lower at 89. L.M.S.R. 4 per cent.

preference fluctuated between 47 and 50, while the 1923 preference was lowered to around 30 and the ordinary stock to 12. The 4 per cent. guaranteed stock was lower at 80 in accordance with the general trend, while the 4 per cent. debentures were quoted at 88½. Among L.N.E.R. issues the second preference declined to around 10, and the first preference to 26, while the guaranteed stocks also made lower prices. Great Western ordinary rallied strongly on Tuesday, but later declined further to 25, while the 5 per cent. preference was 79 and would appear to be much undervalued in relation to the corresponding stock of the Southern Railway. London Transport "C" was inclined to benefit from the prospect of higher fares in the London district, but after rallying to 74 the price reacted to 72.

Very little business was reported in foreign railway securities, and on balance heavy declines were shown by most of the Argentine railway securities owing to prevailing conditions on the Stock Exchange. Canadian Pacific transferred around 4½, and the preference around 23. American rails were sold.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1938-39	Week Ending	Traffic for Week		No. of Weeks	Aggregate Traffic to Date			Shares or Stock	Prices						
			Total this year	Inc. or Dec. compared with 1938		Totals		Increase or Decrease		Highest 1938	Lowest 1938	Mar. 22, 1939	Yield (See Note)			
						This Year	Last Year									
South & Central America	Antofagasta (Chili) & Bolivia	834	19.3.39	19,650	+	390	11	150,200	192,680	-	£ 42,480	Ord. Stk.	14	71½	7	Nil
	Argentine North Eastern ..	753	11.3.39	8,455	+	924	37	353,876	340,448	+	13,428	A. Deb.	82	75	72½	51½
	Argentine Transandine ..	—	—	—	—	—	—	—	—	—	—	6 p.c. Deb.	8	7	7	Nil
	Bolivian ..	174	Feb., 1939	3,700	+	200	8	7,100	7,100	—	—	Bonds.	10	4	61½	71½
	Brazil ..	—	—	—	—	—	—	—	—	—	—	Ord. Stk.	61½	34½	4	Nil
	Buenos Ayres & Pacific ..	2,806	18.3.39	115,074	+	6,513	38	3,192,746	3,291,257	-	98,511	Mt. Deb.	151½	8	121½	Nil
	Buenos Ayres Central ..	190	4.3.39	£70,300	-	£26,200	36	\$3,744,800	\$4,333,100	-	\$588,300	Ord. Stk.	179½	5	91½	Nil
	Buenos Ayres Gt. Southern ..	5,082	18.3.39	172,270	+	14,455	38	5,382,505	5,680,693	-	308,188	"	125½	5	71½	Nil
	Buenos Ayres Western ..	1,930	18.3.39	53,164	+	8,251	38	1,664,640	1,726,303	-	61,663	"	134½	5½	8½	Nil
	Central Argentine ..	3,700	18.3.39	127,854	+	17,758	38	4,379,698	4,685,070	-	315,374	"	6	2½	4	Nil
	Do. ..	—	—	—	—	—	—	—	—	—	—	Dtd.	3	11½	11½	Nil
	Cent. Uruguay of M. Video ..	972	11.3.39	18,820	-	58	37	674,834	661,827	+	13,007	Ord. Stk.	38½	5½	21½	Nil
	Cordoba Central ..	1,218	—	—	—	—	—	—	—	—	—	Ord. Inc.	28	22½	22½	87½
	Costa Rica ..	188	Jan., 1939	16,626	-	6,724	31	155,492	178,556	-	23,064	Stk.	105½	104	103½	51½
	Dorada ..	70	Feb., 1939	12,800	-	1,900	8	26,100	32,400	-	6,300	1 Mt. Db.	71½	3½	5	Nil
	Entre Rios ..	810	11.3.39	14,280	+	850	37	573,210	534,430	+	38,780	Ord. Stk.	3½	1½	1½	Nil
	Great Western of Brazil ..	1,092	18.3.39	10,700	+	3,500	11	125,800	99,100	+	26,700	Ord. Stk.	—	—	—	Nil
	International of Cl. Amer. ..	794	Jan., 1939	\$548,273	+	\$61,132	4	\$548,273	\$487,141	+	\$61,132	1st Pref.	6d.	6d.	1½	Nil
	Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	—	—	Stk.	8	61½	71½	Nil
	La Guaita & Caracas ..	22½	Feb., 1939	4,655	-	315	8	9,405	9,580	-	175	Ord. Stk.	4	1	2	Nil
	Leopoldina ..	1,918	18.3.39	20,218	+	1,517	11	228,001	213,936	+	14,065	"	14	1½	1½	Nil
Mexican ..	483	14.3.39	\$309,900	+	\$12,900	10	\$3,233,100	\$3,306,400	-	\$73,100	"	7½	1½	1½	Nil	
Midland of Uruguay ..	319	Feb., 1939	9,048	-	1,572	35	73,489	75,972	-	2,483	Ord. Sh.	52½	19½	19½	61½	
Nitrate ..	386	15.3.39	7,012	-	1,437	10	26,214	39,775	-	13,561	Pr. Li. Stk.	60	55½	47½	125½	
Paraguay Central ..	274	11.3.39	\$3,012,000	+	\$56,000	37	\$11,244,000	\$11,076,000	-	\$3,832,000	"	55½	14½	2½	Nil	
Peruvian Corporation ..	1,059	Feb., 1939	61,801	—	10,736	35	539,567	660,322	-	120,755	Pref.	23	20	19½	Nil	
Salvador ..	100	11.3.39	£33,750	+	£8,700	37	£776,714	£734,675	+	£42,039	Pr. Li. Db.	64	28	25½	151½	
San Paulo ..	153½	12.3.39	28,200	-	2,095	10	277,736	319,600	-	41,864	Ord. Stk.	15½	1½	1½	10	
Taitai ..	160	Feb., 1939	3,010	+	1,170	35	23,795	30,670	-	6,875	Ord. Sh.	38½	1½	1½	Nil	
United of Havana ..	1,353	18.3.39	50,320	-	7,328	38	822,091	907,738	-	85,647	Ord. Stk.	2	1	2	Nil	
Uruguay Northern ..	73	Feb., 1939	789	-	255	35	8,250	7,481	+	769	Deb. Stk.	—	—	—	Nil	
Canada	Canadian National ..	2,237½	14.3.39	639,970	-	1,123	10	6,603,853	6,612,288	-	8,435	Perp. Dbs.	72	60	69	51½
	Canadian Northern ..	—	—	—	—	—	—	—	—	—	4 p.c.	104	90	97½	41½	
	Grand Trunk ..	—	—	—	—	—	—	—	—	—	163,200	Ord. Stk.	87½	41½	41½	Nil
Canadian Pacific ..	17,186	14.3.39	461,800	-	4,400	10	4,717,400	4,880,600	-	163,200	"	—	—	—	Nil	
India*	Assam Bengal ..	1,329	28.2.39	39,435	+	327	49	1,393,002	1,279,425	+	113,577	Ord. Stk.	81½	70	73½	41½
	Barsi Light ..	202	28.2.39	2,505	-	525	49	126,990	127,432	-	442	Ord. Sh.	60½	54½	54½	75½
	Bengal & North Western ..	2,108	28.2.39	70,914	+	1,505	22	1,218,161	1,170,762	+	47,399	Ord. Stk.	311	278	262	67½
	Bengal Doonars & Extension ..	161	10.3.39	2,816	-	641	50	140,672	139,026	+	1,648	"	89	83	85	78
	Bengal-Nagpur ..	3,272	28.2.39	174,225	-	2,340	49	6,420,641	6,463,623	-	42,982	"	95½	90	91½	45
	Bombay, Baroda & Cl. India ..	3,085	10.3.39	240,360	-	48,600	50	8,286,150	8,401,200	-	115,050	"	112½	95	104½	54½
	Madras & Southern Mahratta ..	2,967	28.2.39	149,175	+	173	49	5,144,044	4,867,206	+	276,838	"	108	97	100½	71½
	Rohilkund & Kumaon ..	571	28.2.39	12,565	-	2,273	22	225,467	226,780	-	1,313	"	308	285	272	68
	South Indian ..	2,531½	28.2.39	97,724	-	3,916	49	3,750,541	3,835,654	-	85,113	"	104	101	100½	5
	Beira-Umtali ..	204	Jan., 1939	76,317	-	3,514	17	326,567	356,561	-	29,994	—	—	—	—	Nil
Various	Egyptian Delta ..	620	28.2.39	4,597	+	89	49	207,694	219,673	-	11,979	Prf. Sh.	78	5½	—	Nil
	Kenya & Uganda ..	1,625	Feb., 1939	253,899	-	1,712	8	503,301	539,655	-	36,354	"	—	—	—	Nil
	Manila ..	—	—	—	—	—	—	—	—	—	B. Deb.	49	41	43½	65½	
	Midland of W. Australia ..	277	Jan., 1939	14,947	+	1,305	31	107,233	97,977	+	9,256	Inc. Deb.	93½	89	93	41½
	Nigerian ..	1,900	4.2.39	46,509	-	25,415	45	1,789,073	2,461,548	-	672,475	"	—	—	—	Nil
	Rhodesia ..	2,442½	Jan., 1939	339,253	-	53,949	17	1,511,391	1,710,441	-	199,050	"	—	—	—	Nil
	South Africa ..	13,285	11.3.39	635,860	+	26,765	49	30,701,325	31,705,225	-	1,003,900	"	—	—	—	Nil
Victoria ..	4,774	Dec., 1938	859,188	-	55,580	26	4,733,741	4,747,229	-	13,488	"	—	—	—	Nil	

NOTE.—Yields are based on the approximate current prices and are within a fraction of ½%.

† Receipts are calculated @ 1s. 6d. to the rupee § ex dividend

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being over estimated. The statements are based on the current rates of exchange and not on the par value